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ABSTRACT

This research examined the learning style factor of field dependence/independence and the problem solving strategies of Hmong male refugee students 17 years old and older who were attending or planning to attend post secondary education institutions in Wisconsin and Minnesota. The research was conducted from July 1986 to July 1987 to test two hypotheses: that no significant difference existed between the mean scores of Hmong subjects and those of the norm group on the Group Embedded Figures Test, and that there was no significant relationship between the learning styles of the subjects and their problem solving strategies. The subjects were first tested in groups with the Group Embedded Figures Test. Then each subject was individually interviewed regarding the problem solving strategies he used to take the test. Two major results were found. First, the sample group was found to be primarily field dependent with statistical significance at the 0.01 level. Second, a positive relationship was found to exist between the learning styles of subjects and their problem solving strategies with statistical significance at the 0.001 level. Major conclusions are that Hmong male students 17 years old and older attending or planning to attend post secondary education institutions tend to be primarily field dependent in learning style, and to use primarily global problem solving strategies; and that a positive relationship exists between their learning styles and their problem solving strategies. An extensive list of references is included. (Author/PS)

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LEARNING STYLE FACTOR OF FIELD DEPENDENCE/INDEPENDENCE AND PROBLEM SOLVING STRATEGIES OF HMONG REFUGEE STUDENTS

by

Karin Marie Evenson Worthley

A Thesis

Submitted in Partial Fulfillment of the

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With a Major in

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July, 1987

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ABSTRACT

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This research examined the learning style factor of field dependence/independence and the problem solving strategies of Hmong male refugee students 17 years old and older who were attending or planning to attend post secondary educational institutions in Wisconsin and Minnesota. The research was conducted from July, 1986 to July, 1987 to test two hypotheses: that no significant difference existed between the mean scores of Hmong subjects and those of the norm group on the Group Embedded Figures Test, and that there was no significant relationship between the learning styles of the subjects and their problem solving strategies.

Subjects were first tested in groups with the Group Embedded Figures Test. Immediately following the test, each subject was individually interviewed regarding the problem solving strategies he used to take the test. The Group Embedded Figures Test, developed to provide screening on field dependence/independence, presents the subject with 18 complex figures in each of which are embedded one of eight simple forms. The subject must correctly trace the simple form within the complex figure to complete each item. The researcher-designed interview consisted of open ended questions developed to determine the problem solving strategies used by subjects as they attempted to complete the Group Embedded Figures Test. On the basis of test and interview data, subjects were classified as field dependent or field independent and as users of primarily global or primarily analytical problem solving strategies.

Two major results were found. First, the sample group was found to be primarily field dependent with statistical significance at the .01 level. Second, a positive relationship was found to exist between the learning styles of subjects and their problem solving strategies with a statistical significance at the .001

level. Both null hypotheses were rejected by the findings of this study.

Major conclusions are that Hmong male students 17 years and older attending or planning to attend post secondary educational institutions tend to be primarily field dependent in learning style, to use primarily global problem solving strategies, and that a positive relationship exists between their learning styles and their problem solving strategies.

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Chapter I

INTRODUCTION

Since 1975, thousands of Southeast Asian refugees have fled their homes in Vietnam, Cambodia, and Laos to find their way to the United States where they are attempting to build new lives. According to a study by the Population Reference Bureau based on U.S Census Bureau statistics, between 1970 and 1980, a decade in which the total U.S. population increased by only 11%, the Asian-American population soared by 141% (Associated Press, 1985). One particular group of Asian refugees, the Hmong hillpeople from northern Laos, has settled in large numbers in the upper Midwest, with over 10,000 in Minnesota (Covert, 1986), and 12,500 in Wisconsin (Blinkhorn, 1987).

Education of the Hmong in the U.S.

Now over 65,000 Hmong, approximately 8.3% of all Southeast Asian refugees who have settled in the United States since 1975, are here as permanent resident aliens (Hayes & Kalish, 1985). Both primary and secondary migration are bringing more Hmong to Wisconsin and Minnesota, where opportunities for attending vocational school, community colleges, or

other post-secondary schools are high. Figures from the Minnesota Department of Education show that the number of students of Asian ancestry in Minnesota public elementary schools increased from 7240 in the 1979-80 school year to 14,550 in the 1984-85 school year (Associated Press, 1985).

A growing number of Hmong youth express the belief that if they are to succeed in the complex technological society in which they find themselves, they will need post-secondary education. However, lack of English language skills, lack of general educational background, and lack of familiarity with the culture have made pursuing higher education a very difficult task for many of them (Pao Vang, personal communication, March 18, 1986).

Nevertheless, a growing number of Hmong are completing either high school or specialized lower level English-as-a-Second-Language (ESL) programs and have enrolled in vocational technical schools, community colleges, and four-year colleges or universities. As Reading/Writing Specialist in the Academic Skills Center at the University of Wisconsin-Stout, this researcher has had the opportunity to observe a mushrooming of the Hmong

student population in the past several years. UW-Stout records from 1983 to 1986 indicate that the enrollment of Hmong students at Stout grew from a single student in 1983 to 34 students in 1986 (Ray Rivera, Ethnic Services Coordinator, personal communication, May 29, 1987). Additional Hmong students are expected to enroll in fall, 1987.

Educational Needs

It is expected that this number will continue to grow, and that most of these students will need support services in communication skills including reading comprehension, vocabulary development, and writing. Work that this researcher has done for the past four years in developing reading and writing skills with the Hmong has indicated that many Hmong post secondary students need higher skills especially in understanding abstract vocabulary, and comprehending long abstract sentences. Many of the Hmong students with whom the researcher works have never gone to elementary school in the United States, and have had no formal developmental reading instruction of the kind that is delivered in elementary school but seldom in junior or senior high school. The researcher has used college content area textbooks to teach comprehension skills to

Hmong students struggling with these textbooks in the courses they are taking. Research indicates that Asian Americans of all groups score lower than non-Asians on tests of verbal ability (Hsia, 1985a). Hmong students who entered UW-Stout in the fall of 1985 scored at or below the 7.5 grade level in reading comprehension on the Adult Basic Language Examination. This research study has grown out of the researcher's desire to provide Hmong students with whom she works with more effective materials and methods of improving their critical reading and writing skills.

Educational Support Programs

In spite of the problems Hmong post secondary students face, a driving motivation to learn and to succeed in college characterizes many of them. This researcher has observed Hmong students' continued willingness to work long hours; often these students take appointments with the researcher at very early or late hours or even on weekends when they know it means being able to get extra help on difficult assignments. Hmong students enrolled in a study skills course at Stout report that, in addition to approximately 15 hours of class attendance a week, they and most of their Hmong classmates spend a minimum of 50 hours a

week studying. Of 34 Hmong students at Stout, 25 regularly use the services of the Academic Skills Center to receive support services in the forms of non-credit one-to-one tutoring, small study groups, reading improvement programs, and study skills classes.

However, programs designed for other groups of underprepared college students do not necessarily address the specific needs of Hmong students who add the stress caused by years of war and refugee camps to the frustration of trying to read college level textbooks, write college level papers, and listen to college lectures, all in a language intensely different from their own.

Learning Style as Instructional Tool

One way educators can help provide more effective instruction for Hmong students is by designing instruction with the students' learning styles in mind. This researcher is particularly able to do this since much of her work is in one-to-one or small group situations. Pertinent research on students who have the opportunity to learn through an approach that uses their own learning style strengths indicates that students learn more, more easily, and remember better when they are taught through their preferred learning

styles. Dunn and Bruno (1985) report that students taught through methods that fit their preferred ways of learning achieve better. Learning that occurs in a style preferred by the learner will increase learning, and knowledge of the learning style of the learner can aid in curriculum development, program planning, and instruction (James & Galbraith, 1984). Costa (1985) found that field independent learners learn best through an inductive approach while field dependent learners learn best deductively. Research has shown that cognitive styles influence how students learn, how teachers teach, and how students and teachers interact (Kogan, 1971; Witkin, Moore, Goodenough, & Cox, 1977).

Impact of Culture on Learning Style

It seemed to the researcher as the result of informal observation that many of the Hmong students with whom she worked showed similar ways of dealing with learning problems. A number of researchers have studied the impact of culture on learning style, and have found commonalities within cultures and differences among cultures. Gordon (1976) reports differing patterns of intellectual function in a variety of cultural groups in the United States and in other countries. Lesser (1976) indicates that

different modes of thinking are characteristic of different cultures. Pai (1984) also concurs that different cultures have different learning styles. Kolb (1984) summarizes the major role that cultural experience plays in the development and expression of cognitive functioning in reference to studies that show consistent differences in thinking styles across American ethnic groups, and in global and abstract functioning in different cultures.

A number of studies confirm what Kolb reported. Cohen (1969) found that urban inner-city children preferred a global, holistic mode of problem solving in contrast to middle-class children who used an analytical parts-specific thinking style. A study of Native American children by Guilmet (1976) suggests that they behave quietly in school because at home and in their community they learn primarily through nonverbal mechanisms. Significant differences were found to exist between the learning styles of Alaskan native and white students ("Bilingual, bicultural," 1985), and, in studies of Chinese American children by Young and Lum (1982), the learning styles of the Chinese American children were found to differ from those of white American children.

Asian American Learning Style

Although a number of studies on the learning styles of American ethnic groups have been completed, there is a paucity of educational research on Asian Americans in general (Hsi & Lim, 1977) and Southeast Asian refugees in particular. Kitano (1980) reports that little is known about the specific educational needs of Asian American children, perhaps because of the stereotype of Asian Americans as members of a successful "model minority" (p.13). Certainly, a relative lack of educational research attention has been given to Indochinese refugees (Kleinmann, 1985). Hsia (1981) calls for the initiation of cognitive style research among Asian American groups other than the Chinese, and points out that the Asian American population is not homogenous, but multiethnic and multicultural. Chamot and Stewner-Manzanares (1985) have identified the need for research on English-as-a-Second-Language and cognitive style in order to better teach ESL students. It cannot be assumed that research completed about non-refugee populations of ESL students will necessarily hold true for refugee populations. Rubin (1981) identifies the need for further research to determine the most

effective methods to teach Indochinese refugee students.

Educational Outlook for the Hmong

Of all the recent refugee groups in the United States, according to federal officials, no other refugee group is having more difficulty adjusting to life in the U.S. than the Hmong (Morin, 1983). The Hmong have a saying, "If you think it's easy, you don't know America" (p. 1). In Ramsey County, Minnesota, of some 8000 Hmong residents, nearly half are on welfare (Doerner, 1985). Because of poor employment, 70% to 75% of the 12,500 Hmong in Wisconsin depend on welfare (Blinkhorn, 1987).

Nevertheless, Hmong youth seem determined to climb the educational ladder that they see as the way out of a life of welfare dependency for themselves and their families. Rosine Schmitt, resettlement director for Catholic Social Services in Milwaukee, says of the Hmong, "There will be a change in the next five years. I think the Hmong are moving very fast. The youngest generation is taking over. They're not afraid to say, 'I don't know; please teach me'" (Blinkhorn, 1987, p. 17). As a people, the Hmong have faced difficulties in the past, and survived, following the leadership of the

older generation. The younger generation seems to realize that in the current struggle they will play a critically important role.

Hsia (1985b) reports that Asians enter and stay in the educational pipeline in higher proportions and leave it at later ages than all other groups. In addition it is "the newcomers, not the third and fourth generation Asian Americans, who are investing the most heavily in higher education . . . " (p. 4). These newcomers face particular struggles compounded by their language difficulties. In a discussion of the "silent minority," Hsia (1985b) expresses the belief that Asian Americans will continue to face difficulties in career development unless they acquire the verbal fluency needed for advancement in any field. A survey of immigrant and refugee students at the University of California-Berkeley identified coping with the amount of reading as their greatest problem (Scherini, 1980). Relatively low verbal abilities have been particularly marked among economically disadvantaged Asian Americans (Hsia, 1985a), and, again and again, Hmong students identify trouble with English as one of their greatest problems.

Importance of Learning Style Research to the Hmong

Students such as these, many of whom have had little or no formal schooling before entry into the United States can benefit from the chance to learn in their own learning styles. Erhardt (1980) says that "when students have experienced considerable frustration in previous learning environments or are encountering new and difficult material, . . . a concerned attempt should be made . . . to match the cognitive style of the student" (p. 4). An educational program that matches the cognitive style of Asian American children will allow the student who has been raised in an Asian culture to maintain his self-esteem while he learns (Lee, 1976).

Finally, in a descriptive study of adult learning styles, Dorsey and Pierson (1984) say that identifying a group's dominant learning style can provide a framework for designing educational programs. Many post secondary teachers seem to be unfamiliar with the background of Hmong students, and could perhaps become more effective in helping these students learn if they knew more of the Hmong learning styles. This researcher has felt the need for developing instructional materials and methods with which to teach

reading and writing skills to Hmong students. Research on the learning styles of Hmong students could add to the literature and extend the body of knowledge being accumulated on the cultural impact on learning style. Even more, discovering the learning styles of Hmong students in order to determine instructional methods and develop materials could begin to make the goal of higher education more attainable for this group struggling to succeed in a bewildering new homeland.

Research Proposal

Statement of the Problem

Presently, state colleges, universities, and vocational schools are striving to educate students from a broader range of backgrounds than ever before. Students who might not have attempted college in the past when jobs of all kinds were more plentiful are now enrolling in order to become competitive in the tighter job market of today. More and more, state colleges and universities especially are serving a varied student population. At the same time, these public institutions of higher education must also remain accountable to state legislatures in providing cost-effective services. The search for ways to reach a wide variety of students in the most effective ways

is leading more and more educators to teach using methods that take into account the preferred learning styles of their students. Designing learning materials, determining instructional methods, and structuring learning situations based on student learning styles can lead to more efficient teaching, particularly with the type of students who have not been part of the traditional college student body of the past.

One such group, very new to the American higher education scene, who is seeking higher education in rapidly growing numbers is the Hmong. Although the problems Hmong students encounter in obtaining higher education may seem overwhelming, teachers and other support service personnel are often impressed by the motivation and effort put forth by a great majority of these students and have tried to help and encourage them in their pursuit of a vocational school, college, or university degree.

However, little is known of the learning styles of Hmong students. It is not clear whether Hmong students possess a wide variety of learning styles or whether members of this fairly discrete cultural group tend to share a common style. It is also not known if the

problem solving strategies of Hmong students reflect a global or an analytical basis. Consequently, it is difficult for teachers to effectively adapt instruction to meet the educational needs of Hmong students.

Purpose

The purpose of this study is to identify the learning styles of Hmong male students aged 17 years and older who are either attending or planning to attend post secondary educational institutions. The study will also identify problem solving strategies chosen by the same individuals when faced with a difficult task. The factor of field dependence/field independence is the learning style factor to be examined.

Research Questions

Answers to the following questions will be sought:

1. To what extent are Hmong students field dependent or field independent in learning style?
2. To what extent are the problem solving strategies of Hmong students global or analytical?

3. Do the problem solving strategies of Hmong students correlate with their learning styles?

Hypotheses

It is hypothesized that Hmong male students aged 17 years and older who are either attending or planning to attend post secondary educational institutions will be predominantly field dependent in learning style as measured by their performance on the Group Embedded Figures Test, and that the problem solving strategies of these students will be predominantly global as assessed by personal post-test interviews with each student about how he approached the task of the test. It is further hypothesized that students who measure field independent in learning style will choose analytical problem solving strategies to accomplish the test, and students who measure field dependent in learning style will choose global problem solving strategies to accomplish the test.

The relationships specified in the research hypotheses are restated for testing purposes in the following null hypotheses:

Ho_1: There is no significant difference as measured by t-test for independent means between the mean score of Hmong students i..

this study on the Group Embedded Figures Test and the mean score for American college males on which the Group Embedded Figures Test was originally normed.

Ho_2: There is no significant relationship as tested by chi square between field dependence/independence as indicated by scores on the Group Embedded Figures Test and global or analytical problem solving strategies as indicated in post test interviews.

Assumptions

The first assumption is that students do exhibit specific learning styles.

The second assumption is that learning styles can be measured.

The third assumption is that the interview instrument used for data collection is valid and reliable.

Definition of Terms

The following terms are necessary in this study and are used as defined:

1. **Learning style** refers to an individual's preferred mode of perceiving, processing, and using information in learning situations.
2. **Field dependence** refers to the learning style factor in which perception of a specific element in a field is strongly influenced by the surrounding elements. Field does not necessarily imply a visual field only.
3. **Field independence** refers to the learning style factor in which perception of a specific element in a field is not strongly influenced by the surrounding elements. Field does not necessarily imply a visual field only.
4. **Problem solving strategy** refers to the specific non-enduring manner in which an individual approaches a problematic task in order to find a solution. One individual may employ a number of problem solving strategies depending on the situation or the problem.
5. **Global problem solving strategy** refers to a strategy in which the individual uses skills such as synthesis, imaging, trial and error, and deductive reasoning.

6. **Analytical problem solving strategy** refers to a strategy in which the individual uses skills such as data analysis, breaking the problem into sub-problems, and inductive reasoning.

Scope and Delimitations

Several conditions existed for the study that may have affected the results and about which the reader should be informed.

Subjects were volunteers and as such may have been a self-selected group. It was not possible for the researcher to find a large enough group to randomly select subjects for this study.

Subjects varied in the number of years they had attended school. Because of the disruption caused by the war and refugee camp internment, schooling for some subjects had been interrupted or even non-existent prior to their arrival in the United States. Subjects who had spent more years in school may have had more practice taking paper and pencil tests.

Subjects were tested and interviewed in a variety of places because many of them did not live near the University of Wisconsin-Stout.

Interviews were conducted in English and subjects exhibited various levels of English competency. The

researcher, who has taught English-as-a-Second-Language for over 20 years, made an informal assessment of each subject's English skills during the interview. Although subjects seemed to understand the researcher's questions, there may have been misunderstandings of which the researcher was unaware.

Although there is no reason to believe that the Hmong students who participated in this study are different as a group from other Hmong students who are attending or planning to attend post-secondary educational institutions in other places, this may indeed be the case.

Summary

This study to determine the learning styles and problem solving strategies of Hmong male students (n=42), 17 years old to 36 years old, who were attending or planning to attend a post-secondary educational institution, was conducted in Wisconsin and Minnesota from July, 1986 to July, 1987. Subjects were volunteers from high schools, community colleges, vocational-technical schools, business schools, colleges, and universities in Wisconsin and Minnesota. Subjects were tested using the Group Embedded Figures Test (GEFT) and individually interviewed following the

testing. Subjects also answered a questionnaire regarding their educational background, choice of post-secondary major, favorite and least favorite subjects in school, and cumulative GPA. The results of the GEFT were analyzed by t-test comparing scores to the published norms. The results of the interviews were analyzed by classifying and counting global and analytical problem solving strategies reported by each individual. The relationship between GEFT scores and problem solving strategies were analyzed by chi-square. The results of this study will be reported and discussed later in this paper.

Chapter II

REVIEW OF LITERATURE

Introduction

This literature review will present the findings of an investigation of literature about learning styles and about the Hmong. Under the topic of learning style, the following subtopics will be considered: learning style theory, the relationship of field dependence/independence to Witkin's theory of psychological differentiation, characteristics of field dependence/independence, the relationship of culture to learning style, the socialization process, sociocultural tightness, ecological adaptation, the biological effect, Berry's unified concept of cultural impact on field dependence/independence, the effect of language, acculturation, and the Group Embedded Figures Test.

Under the topic of the Hmong, the following subtopics will be considered: history, social structure, economic structure, education, spiritual values, effects of the war, effects of refugee camp internment, effects of emigration to the U.S., and Hmong learning styles.

This discussion will lead to the development of hypotheses regarding Hmong learning styles and problem solving strategies.

Learning Style

Educators have long searched for ways to teach all students more effectively, but particularly students who have difficulty in learning. Seeking to better understand the individual student, educators are becoming aware of individual differences not only in the areas of ability and background, but also in the way in which an individual approaches a learning situation. The manner in which an individual selects, structures, organizes, makes decisions about, and ultimately uses his experiences in learning situations is his learning style, and can, in the opinion of scholars such as Messick, have profound impact on education. He states (1984) that attention to student learning styles can improve instructional methods, enrich teacher behavior and conceptions, enhance student learning and thinking strategies, expand guidance and vocational decision making, broaden educational goals and outcomes, and tune the stylistic demands of learning environments.

Theory

Learning style theory states that individuals have their own preferred ways of learning, and a number of models have been developed to describe these ways.

Some researchers identify learning style as cognitive style. Evidence is accumulating to show that within any educational group each individual possesses a relatively pervasive and stable style that need not be the same as the styles of others in the group. According to Goldstein and Blackman (1978), "common to all theory and research on cognitive style is an emphasis on the structure rather than the content of thought. . . . Structure refers to how cognition is organized; content refers to what knowledge is available" (p. 3).

Researchers have begun to classify and document individual learning styles, not only in Western cultures, but around the world. Indeed, learning style research seems to be taking place on almost every continent, with studies reported from Africa, Asia, Australia, and Europe as well as North America. A review of the literature by Erhardt (1980) indicates that 30 learning style models have been developed to classify a variety of characteristics; often these

models measure the presence of a characteristic along a valueless continuum (e.g. abstract to concrete) with few individuals placed at either extreme. The learning style factor that has been most extensively studied is the factor called field dependence/field independence (FD/FI), first identified by the late Herman Witkin and his co-workers in the 1940s and early 1950s.

Of all the ways, then, that researchers have described the styles in which people learn, field dependence/independence was the first developed and has been the most thoroughly investigated.

Relationship of Field Dependence/Independence to Witkin's Theory of Psychological Differentiation

Field dependence/independence is part of a much broader concept, Witkin's theory of psychological differentiation which grew from years of research. This theory is the umbrella under which the concept of field dependence/independence is found.

Witkin had begun by studying factors related to "perception of the upright" in 1942 (Goldstein & Blackman, 1978). He noted the consistency of an individual's characteristic way of perceiving from one situation to another and found that this manner of perception was not easily changed, that it remained

stable through the years of that person's life. Witkin then studied the relationship between performance on the perceptual measures he had developed and performance on other measures concluding that a relationship existed between perception and personality (Witkin, et al., 1954). The Rod-and-Frame Test (RFT) in which a subject in a completely darkened room positioned a luminous rod vertically within a tilted luminous frame, was the major instrument among several in Witkin's early research. Those who oriented the rod to the frame were classified as field dependent. The Embedded Figures Test (EFT) was also developed early in Witkin's research. Designed to measure the embeddedness of a figure hidden within a complex figure, the EFT measured the visual perceptual dimension of field dependence/field independence (Witkin & Goodenough, 1981).

Following these early studies, Witkin moved on to the position that "separating a part from the context in which it is embedded is as much a feature of some kinds of problem solving tasks . . . as it is of the kinds of perceptual tasks we had been considering . . ." (Witkin & Goodenough, 1981, p. 17). By this time, Witkin believed that greater or less disembedding

(analytical) ability was exhibited across an individual's perceptual and intellectual activities. The scope of Witkin's theory broadened to include the view that field independent individuals would impose structure on a field and experience it in an organized way and that field dependent individuals would not. Numerous studies supported this position (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962). As a result of these studies, "analysis and structuring were viewed as complementary aspects of articulation" (Witkin & Goodenough, 1981, p. 18), and the FD/FI concept was enlarged to an articulated field/global field concept.

Finally, when subsequent research linked perceptual style differences to personality style differences, particularly in the areas of controls and defenses, body concept, and the self (Witkin et al., 1962; Witkin et al., 1954), Witkin and his associates expanded the concept to the theory he called psychological differentiation. It stated that, within an individual, self-consistency is exhibited in the perception of degree of separateness of one element from others, whether it be a simple geometric figure from the complex one in which it was embedded or the self from others. Central to the theory of

psychological differentiation is that the development of differentiation is an organism-wide process. Therefore, an individual's level of differentiation is likely to be consistent across diverse domains.

Following 1962, Witkin added the elements of cognitive restructuring and interpersonal competencies to this theoretical construct. While the terms field dependence/field independence have traditionally been used to describe the work of Witkin and so many others, what Witkin finally intended is that these labels would describe the "higher level dimension of extent of autonomy of external referents" (Witkin & Goodenough, 1981, p. 58), or the degree of psychological differentiation an individual displayed. To his earlier characterization of cognitive styles as process variable, pervasive, and stable, Witkin added the characteristics of bipolar with regard to level (no clear high and low ends) and value-neutral (neither FD nor FI are better than the other).

In summary, Witkin's theory of differentiation, then, attempts to explain how people structure their experience -- their perception, their social experience, and their affective experiences. "Differentiation refers to the complexity of a system's

structure" (Witkin, et al., 1962, p. 9). According to Witkin, "The achievement of a relatively differentiated self implies that in the area of experience where the person's own activities and attributes are the source, experience is relatively articulated -- that is, it is analyzed and structured, rather than global" (Witkin, et al., 1962, p. 13).

Characteristics of Field Dependence/Independence

Field dependent and field independent individuals vary in many ways. Each of these ways relates to how differentiated an individual tends to be.

When the concept of psychological differentiation is applied to perception, a factor that may be considered as evidence of the level of differentiation is field dependence/independence. Witkin (1976) says, "The concept of cognitive style does not imply that there are two types of people -- field dependent or field independent" (p. 43). Instead, scores form a continuous distribution and are defined relative to the mean. Although individuals fall within a range on the FD/FI measure and should not accurately be labeled field dependent or field independent, convention and ease of nomenclature allow individuals who are FD or FI

relative to the mean to be labeled either field dependent or field independent.

Because psychological differentiation is not confined to only the cognitive domain, individuals who tend to fall toward either end of the continuum exhibit certain characteristics in regard to cognitive style, personality, and behavior. According to Chickering (1976), analytical ability is the fundamental difference between field dependent and field independent individuals. This analysis is found in their perceptual and cognitive ability to distinguish figure from ground, to separate a construct from its surrounding context, and to restructure problems so that a construct may be used in another way.

Cognitively, the field dependent student tends to rely more heavily on the teacher, the fellow student, the book, the film, or the field experience to present a greater degree of discontinuity, to make the details more evident in the ground in order for differentiation to occur (Chickering, 1976). Kleinmann (1985) reports that English-as-a-Second-Language students' success depends greatly on their ability to analyze linguistic form; a field dependent student would need more help

from referents outside himself in order to do well in an analytical task.

Individuals who tend to be field dependent differ from field independent persons in important personal characteristics as well. They are more imaginative in describing social situations and prefer working in groups (Gardner, 1980) to achieve a common goal (Ramirez and Castaneda, 1974). They use the prevailing social frame to define their attitudes, beliefs, feelings, and even self-view (Witkin, 1976). Field dependent persons, therefore, are especially prone to relying on authority either from an authority figure or the peer group. Criticism has a greater impact on the learning of field dependent persons (Witkin, 1976). Learning is facilitated for FD individuals when performance objectives and global aspects of the curriculum are explained, and when concepts are presented in humanized or story format in the context of personal interest and experience (Ramirez & Castaneda, 1974). Relatively field dependent teachers were found to prefer a discussion method of teaching to either lecture or discovery methods, thus displaying the tendency of field dependent persons to seek interpersonal engagement (Witkin, 1976).

It is unfortunate that Witkin's early studies described field dependent individuals as passive, and having low impulse control, low self esteem, and an undifferentiated body image (Witkin, et al., 1954). These value-laden terms reflect the preferences of Western culture for activity and individualism. Of course, an individual in a Western society who did not exhibit these characteristics would be likely to develop low self-esteem. Some researchers (Ramirez & Castaneda, 1974) concerned that even the term "field dependence" had a negative connotation, substituted the term "field sensitivity." Other researchers seem to have responded very negatively to classification of certain ethnic minority groups as field dependent. While field independent individuals may be more successful in Western societies, educators are not necessarily encouraged to try to "teach" students to be "more field independent."

Witkin and others (Witkin, Oltman, Raskin, & Karp, 1971) discuss the value of field dependence and field independence. According to them, "On the quite specific ground that it involves 'fulfillment of the organism's potential,' achievement of complex structure or greater differentiation is, within limits, to be

valued over fixation at a more rudimentary level" (p. 12). Other things being equal, the differentiated person has more diversified resources available for himself as he selects from among a wide range of options. Witkin states that "It is only in this very limited sense that differentiation carries a positive value judgment" (p. 12). For example, studies indicate that highly differentiated individuals exhibit pathology reflecting impaired modes of integration as often as limitedly differentiated persons. Witkin concludes that "The adaptive value of differentiation may depend on the setting in which an individual is required to function" (p. 13).

Field independent individuals exhibit a perceptual, cognitive, and social sense of themselves as separate from their surroundings. They show personality characteristics such as reserve, control, and independence (Triandis, 1975), and are likely to learn more than field dependent persons under conditions of intrinsic motivation (Witkin, 1976). Moreover, these characteristics, as well as analytic perception, are carried into problem solving behavior as well. The field independent person perceives details as discrete, even when these details are

embedded within a complex context, whether the details are visual, auditory, or of any other sensory mode. Witkin also notes that differentiation will be triggered much more readily in the field independent person than in the field dependent person. Quiet reflection, writing, long conversations may be ways of mediating the effect of an overload of detail, and can move the field independent student to higher levels of integration (Chickering, 1976). Field independent students prefer to compete and gain individual recognition, are often task oriented, tend to be impatient to begin tasks, and prefer learning that emphasizes the details of concepts (Ramirez & Castaneda, 1974).

Field dependent individuals, then, tend to view themselves and all their experiences as part of a larger universe. Field independent individuals, on the other hand, tend to see themselves as separate and their experiences as discrete.

Relationship of Culture to Learning Style

Learning styles tend to vary from culture to culture, depending on what kind of behavior is necessary for success in a particular culture. Five important cultural factors seem to influence learning

style: the socialization process, the tightness of a society, ecological adaptation, the biological effect, and language. Acculturation (influence from another dominant culture) is a related factor.

Cultures are different ways in which people deal with essentially similar problems and needs, and ways in which people assign meanings, values and significance to things, events and behaviors (Pai, 1984). While diversity among individuals within any culture is the norm, research has shown that these individuals tend to exhibit a common pattern of perception when the members of that culture are compared to the members of another culture. A "cultural personality" is more than myth or stereotype. In addition, individuals from relatively pluralistic cultures such as that of the United States (actually a polyglot of many subcultures) tend to exhibit greater diversity in learning style than individuals from relatively singular cultures such as that of the African Kpelle tribe.

What is it that causes people from a culture to tend to have similar learning styles? Several interrelated factors seem to be operative. Cross-cultural studies by anthropologists,

psychologists, linguists, educators, and various combinations of all these have identified five important cultural factors that impact learning style development: the socialization process, sociocultural "tightness," ecological adaptation, biological effects, and the use of language in the culture. Acculturation, the process of culture change resulting from contact with another culture (Berry, 1976), is an adjunct factor.

The learning style factor that has been most studied cross-culturally is field dependence/ independence, as identified by Witkin. Cross-cultural recognition of this factor came as a result of Witkin's theory of psychological differentiation, which within a decade became one of the major conceptual tools in cross-cultural research (Jahoda, 1980). Cultures, then, tend to differ in the amount of differentiation that characterizes them (Triandis, 1975), and these differences can be described on the continuum of the measure of field dependence/independence. How are the causes for the presence of field dependence or field independence in heavy concentration within a certain culture operative?

The Socialization Process

Numerous studies during the 1960s and 1970s throughout the world have examined the socialization process as it relates to field dependence/ independence, and found support for the concept that the degree of differentiation with which a child is socialized is a determining factor of the child's learning style.

The first cultural factor, the socialization process, has been extensively studied and documented by Witkin and many others. Witkin said (1976) "Socialization factors are undoubtedly of overwhelming importance in the development of individual differences in field dependence versus field independence" (p. 47). According to Jahoda (1980), explorations of the origins of enduring styles of perception and behavior suggest that the child's primary mode of socialization is likely to be a critical factor in determining the child's learning style. In general terms, the more permissive the child rearing, the more differentiation will occur in the child, and the more strict the child rearing, the less differentiation will occur. Methods of child rearing include systems of reward and punishment, cultural goals, and socialization practices

which reflect the group's values and influence an individual's methods of communication and learning, as well as determine the kinds of experiences that are psychologically, emotionally, and materially rewarding. These child rearing methods also influence the development of a perceptive framework with which to view and relate to the environment.

Initial investigations of the effect of family experiences were done with children growing up in New York City and their mothers (Witkin et al., 1962; Dyk & Witkin, 1965). The highly related factors of handling of separation, regulation of impulse expression, and the view a mother had of herself in these processes formed a cluster that influenced a child's progress toward separate autonomous functioning, according to Dyk and Witkin. Child rearing practices that encourage separate autonomous functioning foster the development of differentiation in general and of a field independent cognitive style in particular. In contrast, child rearing practices that encourage continued reliance on parental authority are likely to cause less differentiation and more field dependence, according to Witkin and Goodenough (1981).

Pioneering work in examining the socialization of children in non-Western cultures, testing the universality of the relationships established in Western settings and uncovering new ones was done in numerous studies in the 1960s and 1970s. These studies revealed that societies that exercised more control over children tended to produce more people who were field dependent. A major study of six villages, two each in the countries of Holland, Italy, and Mexico, in which each pair of villages included one in which adherence to social convention was stressed and one in which it was less important, confirmed the hypothesis that child rearing practices that stressed conformity produced more field dependent children (Witkin, et al., 1974). MacArthur (1971), in a study of the Igloolik Eskimo, found that encouragement of separation from family control, encouragement of initiative, resourcefulness during upbringing and control of aggression were associated with field independence within the culture. In a study conducted in Sierra Leone comparing the Temne, a very strict tribe that stressed discipline and practiced severe physical punishment, with the Mende, who encouraged early child responsibility, Dawson (1967) found a correlation

between maternal dominance and field dependence. When comparing the Temne to the Arunta, permissive Australian hunters similar to the Eskimo, Dawson found the Arunta to be more field independent than the Temne (1972). Britain (1974) in a study comparing Cuban and American teenagers found that the Cuban teenagers were less field independent than their American counterparts and noted that Cuban culture exhibits a more autocratic socialization process than American culture. A more recent study by Boardman and Lloyd (1978) indicates that the process of education was different for Asian and Puerto Rican American students.

Research by Nedd and Schwartz (1977), however, did not confirm the effect of socialization in all the ethnic groups examined. Adolescent boys and girls from a variety of ethnic groups, religions, social classes, economic levels, and degrees of urbanization in Trinidad were studied. Results indicated that whether modes of child rearing or socioeconomic factors determined FD/FI varied in this study from one particular cultural group to another and depended on the particular circumstances of each group.

Studies of the socialization factor have relevance to this study since Hmong children have been strongly socialized to be group members above everything else.

Sociocultural Tightness

Studies of socialization are highly related to studies that consider the next variable believed to affect field dependence/field independence, the social tightness of the society. Tight societies tend to have an elaborate social structure, considerable role diversity, and pressure on individuals to conform. Loose societies allow individuals more freedom to choose their own way, say Witkin and Goodenough (1981). There is a large body of empirical research (Witkin, et al., 1974) to support the view that a tight social structure and a high value placed upon social conformity lead to a global cognitive style. In one such study Nedd and Gruenfeld (1976) confirmed their hypothesis that emphasis on obedience and social conformity within the family leads to field dependence in children. In this study of six cultural groups in Trinidad, the East Indians, individuals in the most traditional group with the tightest social structure including a caste system, were the most field dependent.

Ecological Adaptation

Ecological adaptation is the third variable identified as a cultural mediator of learning style (Berry, 1976). According to Berry, the relationship between an individual and the enironment he inhabits may be a major factor in the behavior he develops. Berry's comparative study in 1966 of the Temne and the Eskimo of Baffin Island was guided by the hypothesis that differences in perception would be found between societies with different ecological and cultural characteristics. Two villages from each culture and two Scottish villages (to serve a referents from which data would be available to relate the Temne/Eskimo results to the accumulated mass of Western psychological findings) were studied. The Temne represented an agricultural group of food accumulators, and the Eskimo represented a hunting/fishing group. Ecological demands and cultural practices were found to be significantly related to the development of perceptual skills.

Biological Effect

In a number of studies, Dawson (1967) considered the fourth cultural variable, biological effect. Dawson believed that both social and biological factors were

important in developing cognitive style. In the previously mentioned study of the Temne and Mende, he showed a relationship between nutrition and learning style; children lacking protein in the diet tended to become field dependent. Lack of protein was also associated with mixed handedness. The biological effect variable would seem to be related to those variables previously discused since hunters often have higher protein intake than farmers.

Berry's Unified Concept of Cultural Impact on Learning Style

Relationships of this nature led Berry (1976) to develop a conceptualization that would unite the four variables of socialization, degree of social tightness, ecological demands, and biological effect. Berry asked,

> Why does a particular society select child training practices which will tend to produce a particular kind of typical personality? Is it because this kind of typical personality is functional for adult life of the society, and training methods which will produce it are thus also functional? (p.55)

According to Berry, adult economic roles will be consistent to the extent that food must be accumulated and cared for. At one extreme is dependence primarily based on animal husbandry where the meat and milk that will be eaten for years is present on the hoof and must be cared for, fed, etc. Growing of crops is only slightly less confining than animal husbandry. Cultures at this end of the spectrum will emphasize conformity based on traditional knowledge given by elders and social rules designed to bring crops to harvest. Carelessness in performance of duty could cause hunger, not just for a day, but for months to come. Methodical obedience to prescribed rules of behavior is highly valued.

Hunters and fishers, on the other hand, at the other end of the extreme, exist primarily through individual initiative. With no means to store the catch, taking a risk is not so dangerous, since the next day, the individual or the group could return to customary practices if the new procedure didn't work.

In a major study Berry (1976) classified 17 societies on a food accumulation scale, and then looked for relationships between the ecological variable and socialization, degree of social tightness, and

biological effect. He proposed that hunting and gathering societies tend to be loose, while agricultural societies tend to be tight. Socialization in hunting and gathering societies tends to foster independence, achievement and self-reliance, while agricultural societies emphasize responsibility, conformity and obedience. Finally, there is evidence that protein is more available in hunting societies and less in agricultural societies.

The Effect of Language

In addition to these four factors, another equally important cultural factor that impacts learning style is the use of language within a culture. Language and literacy impact not only the content of thought, but the thought process. For the Hmong, lack of literacy could have been an important factor influencing learning style. Because language and thought are interdependent, the structural particulars of one become replicated in the other, says Diebold (1965). According to Cole (1971), who conducted extensive research among Kpelle tribal people in Africa trying to determine why Kpelle children had such a difficult time learning to do math in school, the structuring of cultural experience is reflected in and also in part

formed by the linguistic behavior of that culture. In addition, the cultural differences in the importance and evaluation of speech and language can be taken as something which both reflects cultural personality and shapes the personality development of individuals (Hymes, 1967). Whorf (1967) believes about perception that

> all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar or can in some way be calibrated . . . . When Semitic, Chinese, Tibetan, or African languages are contrasted with our own, the divergence in analysis of the world becomes more apparent; . . . the fact that languages dissect nature in many different ways becomes patent. (p. 71, 72)

A language, then, is a window on the world for viewing and interpreting reality and, as such, can shape that view. Although Munro and Deregowski (1976) failed to confirm that the language used accounts for cross-cultural differences in perception, others have indicated the effect of language on learning style. Young and Lum (1982) say that Chinese children have a preference for the visual since users of the Chinese

code are more used to giving priority to the visual channel of perception because of the visual nature of Chinese writing and the emphasis placed on the written language to unify the diverse Chinese nation. Goody (1977) believes that the differences between modern cultures and primitive cultures can be related to changes in the modes of communication, expecially the introduction of literacy. Literacy is a form of communication more impersonal than face-to-face communication. Goody also states that because literacy changes the way in which knowledge is stored, the individual is allowed to separate him/herself from his/her work in order to examine it. Certainly, if Goody is correct, a preliterate society would tend to be less psychologically differentiated than a literate one.

The effect of the preliterate state of the Hmong on their learning style is discussed by Hvitveldt (1982, 1985, 1986). She suggests that modern literate societies place emphasis on symbolism (in written language particularly) while traditional preliterate societies emphasize learning through the enactive (direct experience) and iconic (observation and modeling) modes. Adults from traditional preliterate

societies often perceive drawings, pictures, and symbols differently from individuals socialized into literate societies. Hvitveldt says, "If traditional preliterate societies make use of perceptual and learning strategies which differ significantly from those common to modern literate societies, such differences must obviously be taken into account when literacy programs aimed at traditional peoples are developed" (1985, p. 27). The lack of literacy in the Hmong could very well have affected the development of thier learning styles.

Acculturation

Although all these cross-cultural studies are relevant to the study reported in this paper, studies of the factor of acculturation may be most important since the Hmong, formerly a preliterate traditionally agriculturalist group, have currently been thrown into the throes of acculturation in an urban, literate society. There are numerous studies in which acculturation is a factor. Hudson (1960) reported that Africans who had been schooled and therefore in greater contact with Western culture perceived drawings and photographs three-dimensionally, while unschooled Africans perceived the same materials two-

attached to this trait is generated by a specific situation in which the characteristic is either appropriate and useful or not. The cross-cultural research seems to this researcher to be consistently presented without value judgments regarding which style is "better." It may be that individuals who are shown to be relatively field dependent may not be as successful as the field independent person in certain situations in a culture in which individualism and self-directedness are highly valued; however, in any culture as diverse as the modern American culture, there should be not only tolerance for persons with diverse learning styles but a desire for differences. The problem seems to lie not with the concept of field dependence/independence but with the value judgments a culture attaches to such a concept.

In summary, cross-cultural research indicates the importance of the socialization process, the sociocultural tightness of the society, ecological adaptation, the biological effect, language, and acculturation as factors influencing whether an individual develops a field dependent or a field independent learning style.

The Group Embedded Figures Test

The Group Embedded Figures Test (GEFT), a modified version of the Embedded Figures Test, seems to be an appropriate instrument for cross-cultural studies of the factor of field dependence/field independence. Designed as an adaptation of the individually administered Embedded Figures Test (EFT), the GEFT makes possible the testing of large numbers of subjects in group settings.

The GEFT was modeled very closely on the EFT with regard to mode of presentation and format. Both the EFT and the GEFT are non-verbal tests which may be applied to groups with native languages other than English and that contain individuals of differing verbal facility. These characteristics made possible the use of the EFT (and then later the GEFT) in cross-cultural studies that included cultures very different from that of the United States. Cross-cultural studies cited by Witkin in Berry and Dasen (1974) have successfully applied tests of field dependence to a variety of non-Western indigenous groups.

Several problems exist in using the test, however. One problem with the GEFT is that no further validation

data has been included in the manual which was published in 1971. Another is that normative data developed for the GEFT was based on small samples of Eastern liberal arts college men (N=155) and women (N=242) and is minimal data. These norms may not be appropriate for subjects of cross-cultural studies. Although Goodstein (1978) states "the GEFT is a different and potentially powerful approach to tapping one of the cognitive style dimensions of human persnality" (p. 838), a study by Renna and Zenhausern (1976) demonstrated that the GEFT norms published in the GEFT manual cannot be universally applied to populations other than the norm group, and even to a comparatively similar population. Goldstein states,

> While clearly the test is not yet ready for use on an individual basis, it does appear to be a well-conceptualized and well-researched instrument. Its current use, however, will depend more upon the cognitive or research style preferences of psychological researchers than upon the psychometric characteristics of the instrument. (p. 838)

Panek, Funk, and Nelson (1980) in a study of the reliability of the GEFT across the life span found that

the test has adequate split-half reliability and validity as estimated by measure of internal consistency.

A study by Carter and Loo (1979) suggests that norms for the GEFT must be updated to include the various populations upon which the test is used.

It has been argued that the GEFT is not a measure of cognitive style, but a test of ability (indeed, the test correlates highly with the Block Design of the Wechsler tests) and as such assesses "acquired" ability (Ghuman, 1980, p. 84).

The GEFT, nevertheless, is being used in more and more studies in which groups of subjects are measured for field dependence/field independence. It seems to be the only group administered instrument available to measure learning style that does not depend upon the use of language for assessment.

The Hmong

The literature previously discussed in this paper regarding the impact of learning style on learning, psychological differentiation in general, and field dependence/field independence in particular, and especially the cultural influences on learning style is

extremely relevant to a study of the learning styles of the Hmong.

History

Until the mid 1970s, with an estimated population of 350,000, the Hmong were the largest ethnic minority in Laos, a country almost exactly the size of Great Britain, though with a smaller population. Originating in China (with reports of Hmong existence as early as 4000 years ago), as an ethnic minority, the Hmong faced persecution by the Han Chinese which led many Hmong to migrate south into Thailand, Vietnam, and Laos in the early and mid 1800s, where they established villages high in the isolated northern mountains and practiced swidden (slash and burn) agriculture. (A large number of Hmong did, however, remain in China.) It is said that in the 1860s during the first Indochinese war, French officers and soldiers were so fascinated by the Hmong way of life that the Frenchmen had no wish ever to return to France. Although a subsistence economy, a great love of freedom (one meaning given for "Hmong" is "free"), and a close clan structure, the Hmong had gained what seemed an idyllic way of life (Turton, 1973).

Numerous authors have described the traditional Hmong lifestyle. Recently, the Hmong themselves have begun to write about it. Although any discussion of a cultural group must of necessity be organized by topic, Geis (1981) cautions the Western reader of such a discussion to remember about traditional Hmong society that "in the experience and consciousness of Hmong people, there have been no such divisions and life has a wholeness that is taken for granted" (p. 3).

Social Structure

The most important element in the life of the Hmong is their social organization. According to Yang Dao (1982), "The social organization of the Hmong is the reflection of a mentality which remains, across the ages, deeply impregnated with the concept of group, resting on the family and the clan" (p. 3). "The Hmong have extremely strong kinship ties, which go beyond those of other Indochinese," says Li (1981, p. 1). In Laos approximately twenty exogamous patrilineal clans gave solidarity and security to the Hmong; this clan structure continues to exist in the United States. Even today after a generation of disruption, the clan system remains very strong. One Hmong subject of this study told the researcher, "I start college in the

fall. It's a big responsibility. My people are depending on me." A Hmong student the researcher knows explained that during summer vacation he had travelled from Wisconsin to California staying with "cousins" the whole way because "Hmong people don't need hotels; they have family." Yang Dao says, "Marriage, war, and migrations disperse the family, but the clan ties are permanent" (p. 4).

Within the clan system in traditional Laos, the Hmong lived in extended families. The home was the center of activity and the household the basic unit (Sonsalla, 1984). Large families were and still are the norm; in Laos it was common for as many as 35 family members to live together in one house. One Hmong student has told the researcher about his dream of getting a good job so that he could use the money he made to start a Hmong community in which Hmong people could live together in big houses the way they did in Laos. He explained, "There aren't the right kind of houses in the United States to make Hmong people happy. We like to have our whole family around."

Typically in Laos a household included a man, his wife or wives, his children, the wives and children of his sons, and possibly their children (Sonsalla, 1984).

Within this household, family roles were clearly defined and always hierarchal, with husband and father at the top, and women and children expected to respect and obey their family head. In the extended family conformity to role expectations was stressed (Vang Tou Fu, 1978). The extended family attempted to be socially self-sufficient in terms of providing its own "leader, shaman, musician, blacksmith, marriage negotiator, midwife, etc." (p. 17). The individual who did not conform was placed in constraint. Vang states,

> The important thing to remember is that a Hmong person is never an individual. He is always part of a family. His roles throughout his life have to do with what is expected of him. Thus, when he makes an important decision he will have to take his family [into] . . . consideration. (p. 17)

Barney (1979) states that although Hmong families train their young people to be self-reliant and admire an individualistic spirit, among elders a young person is "just one of a group in the presence of respected elders" (p. 24) and must always pay deference to them even as he grows older himself.

In Laos family units were arranged into small villages, the usual pattern being a few households from

the same clan, with perhaps representation of one other clan, forming the village. Although a village may have had as many as 40 homes, the average village had about 8 (Barney, 1979).

This examination of Hmong social structure points in the direction of field dependence as a Hmong learning style since the Hmong appear to be socialized to be members of a very close-knit group.

Economic Structure

Traditional Hmong economy was based on the raising of crops and livestock. Before the war, each family maintained approximately 30 chickens, 5 to 10 pigs, and often one or several horses for transportation. Cattle and buffaloes were also kept (Yang Dao, 1982). The growing of food was of great importance, with rice (supplemented by a wide variety of vegetables) the main crop for consumption by people, corn for livestock, and opium poppies for a cash crop. The traditional economic life of the Hmong before the war did not include electricity, running water, or machinery. Houses were constructed of wood, and clothing, recognized for its careful workmanship and fine artistic design, was made at home. Materially, the Hmong experienced an adequate life style, and "no Hmong

worked for anyone, rather the family worked together in its own rhythm for its own benefit" (Geis, 1981, p. 5). According to several Hmong students the researcher knows, young enough for their memories of Laos to be only of war years, "Life in Laos was more fun."

Lee (1986) explains that "no Hmong lifestyle is possible without subsistence farming, supplemented by foraging, hunting, some fishing and handicrafts" (p. 56). As the dominant form of economic production, agriculture was related to Hmong religion in rituals such as offerings to appease dead spirits, and biddings for spirits to give protection to the crops. Lee states that "agriculture, thus gives rise not only to rituals but also to the ways in which social roles and the division of labour within the household are observed" (p. 56). The husband was responsible for the physical and spiritual welfare of the family. He selected new farming sites and felled trees when clearing new swiddens (areas prepared by slash and burn). The wife cared for children, prepared meals, fed livestock, shared farming activities with her husband and "consulted with him on family needs or major decisions" (p. 56).

Lee (1986) says that because farming kept family members in close contact at nearly all times without outside influence, socialization of children was strongly affected by the traditional Hmong lifestyle. He says, "It is obvious that subsistence cultivation plays a most significant part in shaping social roles and relations within the household. In order to achieve their economic ends, the Hmong have evolved their own rules of family behavior with rights and obligations that must be adhered to" (p. 57). Children were allowed to begin work, usually with household tasks or the gathering of firewood, at about age four. As the children grew older, tasks became gender specific. Obedience was expected, and if children were defiant and did not respond to a kindly "talking to" from the parent, the child would be punished (Killeen, 1981).

The agricultural life style of the Hmong points in the direction of a field dependent learning style, according to numerous studies reported earlier in this review.

Education

In such a society, education of the young was traditionally carried out in the household. Boys were

taught the skills and attitudes necessary to become a man, and girls those to become a woman. Information was transmitted informally and orally with close personal interaction between the teacher and the learner (Lert, 1980). Children within the Hmong family were taught not to ask questions and to remember that "adults are always right," (Knop, 1982, p. 32). Hmong parents say, "Children don't know anything, don't ask questions" (p. 32).

There were no local schools at all for Hmong to attend until 1939 (The Hmong: Their history, 1979). Although in the 1940s Hmong children in the vicinity of Xieng Khouang were encouraged by the Laotian government to attend school in the provincial capitol (Harmon, 1979), formal schooling was unknown among most of the Hmong until in 1951 the Laotian government mandated education for all children in Laos between the ages of 6 and 14 and established some schools to teach literacy in Laotian and French. However, this law was limited to those who lived within one kilometer of a school (Schwartz, 1982). Schools were found primarily in towns and cities, and the great majority of Hmong were too isolated to take part in the program.

An alternative to local Hmong schools for families that could afford it was to send their sons down out of the mountains to attend school in larger towns in Laos, where the boys boarded with missionaries, or perhaps a Chinese merchant who had traded with the village. Some of these boys went on to the teacher training school, to French high school, or to Lao high school (the first Lao high school was established in 1968). Some even went on to study abroad; as of 1971, 37 Hmong were studying abroad ("The Hmong: Their history," 1979).

It was during the 1950s that Western missionaries introduced a writing system for the Hmong who until then had been preliterate. The Lao government, however, did not allow this system to be taught in schools to the Hmong people (Yang Toua, 1980). Only a small percentage of Hmong learned how to read and write Hmong from missionaries or at home from parents and friends. This widespread illiteracy caused problems later in the education of Hmong. In a program to teach English to Hmong refugees at the Ban Vinai refugee camp in Thailand, Robson (1982) found that Hmong without any literacy skills in Hmong "learned very little, if anything at all from the program" (p. 212).

Geddes (1976) argues that because of the Hmong's strong sense of ethnic identity and desire to maintain their independence, they could see the value of education to strengthen their economic position and to maintain their ethnic distinctiveness. Nevertheless, in the 1960s when the American CIA and the Lao government did provide local educational programs for the Hmong, the disruption caused by military development and war still prevented most Hmong from receiving any formal education. At that time

> many children were put into grade school, some went to high school, and even on to higher education. But because of the war, few were able to [continue to] participate since almost all of the young men were recruited to join the army and the women were forced to stay home and care for their families. (Yang Toua, 1980, p. 4)

Those who did receive formal schooling were taught primarily through lecture and in Lao. By 1969, 60% of the teachers in the local schools were Hmong who had been trained at the national teacher training school in Vientiane (The Hmong: Their history, 1979). Rote learning and memorization, instead of problem solving and discovery, were stressed. Due to a lack of books,

very little outside reading was assigned. The teacher often taught by writing lessons on the board for students to copy and learn by repetition. When interpretation of material was necessary, the teacher provided the interpretation. Explicit directions by the teacher provided the framework for learning. Students were not encouraged to ask questions or to innovate ideas of their own (Harmon, 1979). In rural areas, because of parental wishes, boys and girls were separated. "No teacher would assign a boy and a girl to work together as a team" (Yang Toua, 1980, p. 6).

According to numerous sources, during centuries in China, the Hmong were influenced by Confucian thought in which peaceful coesistence is attained through respect for authority and recognition of one's position in a hierarchal social structure. As in all of Southeast Asia, education was highly valued and teachers were held in high esteem. In the classroom, then, as in the rest of life, rank and status were highly valued, and the socially inferior person (the student) never caused the superior person (the teacher) to be offended, insulted, embarrassed, or to lose face. Knop (1982) says that

> For Hmong students, the teacher is a guide, a respected leader who possesses the power of teaching and who has acquired the knowledge of directing people. When they say, 'My teacher...' they literally mean 'my guide,' morally as well as intellectually. (p. 37)

Hmong children all knew that to be respectful they must be obedient, quiet, submissive, and passive in the classroom. Yang Toua (1980) emphasizes that Hmong students felt that teachers should not be disturbed, so they would ask questions of other students rather than the teacher, and would not risk offending the teacher by admitting they didn't understand an explanation and perhaps imply that the teacher did not explain well. A Hmong high school boy interviewed by Barber (1983) explained that even in the United States, "If a teacher asks a hard question, I don't want to ask her to explain because I think maybe I waste everybody's time" (p. 73).

It is very important to remember, however, that because of the war, for most Hmong over the age of 15 or 16 years old, formal schooling in Laos was in some cases non-existent and in many cases very limited. For them, "learning is more of an experiential and

demonstrative process than an academic one" (Rubin, 1981, p. 15).

The authoritarian nature of Hmong formal education and the contextual nature of Hmong informal education point in the direction of field dependence in regard to the learning style of the Hmong.

Spiritual Values

In contact with Confucianism during their thousands of years in China, with Buddhism during their century in Laos, and with Christianity during several decades of contact with missionaries, most of the Hmong did not practice a formal doctrinal religion, according to numerous sources. Yang Toua (1980), however, presented a different picture of Hmong religion. According to him, half of the Hmong are Buddhist or Confucian, 30% are Protestant, and about 20% are Catholic. Smalley (1986) states that Christianity made solid headway among the Hmong during the 1950s. However, most other sources that discuss the spiritual life of the Hmong indicate that the Hmong traditionally had very strong spiritual beliefs of an animistic nature. These beliefs were expressed in richly symbolic myths and stories that explain the frequent rituals that tied the Hmong in harmony to the spirits

who also inhabited their existence (Johnson, 1982). Geis (1981) states,

> Spiritual forces are believed to be in the trees, in the thunder, in the fields, in the doorway and main pillar of the house, etc. These spirits can be helpful or harmful, . . . and their actions can be affected by the kind of relationship human beings establish with them. (p. 5)

Traditionally, the Hmong were constantly aware of their relationships with the spirits and of the steps they had to take to cultivate the spirits' good will. "Fetishes placed on the body following birth, blessings sought at marriage, before trail journeys or hunting trips, and solicitation of tian [spirit] help during the crop seasons" are all examples of rituals and ceremonies with which the Hmong traditionally showed deference to the spirits (Barney, 1979, p. 41). Ancestor worship was practiced, and the common belief was that "the fortune of an individual or family depends on close observation of ancestral reverence, geomancy and kinship networks" (Lee, 1986, p.57).

Religious ceremonies help to bond kinship groups. According to Lee (1986), two Hmong know that they belong to the same subclan if they perform similar

funeral rituals, and that they belong to the same lineage if they descend from the same ancestor and share similar ancestral rituals. Thus,

> in their world view and ceremonial practices, the Hmong see an explanation for their social groupings; in their kinship ties, they find reason to maintain their religion. Religious ceremonies renew group sentiment, strengthen lineage solidarity, and inspire members to carry out their obligations to the living, the dead and those yet to be born. (Lee, p. 58)

Mythology and chants were very important ways to pass on spiritual knowledge and values from one generation to another, and an expressive system of cultivated language supported the development of poetry, song, and music-making (Caitlin, 1982). According to Geis (1981),

> These artistic elements are often overlooked in analyses of Hmong acculturation, but they provide the basic feeling quality of Hmong life. That quality, . . . clearly expressed through religious practice, is marked by a wholeness in which all things find a place. To the Hmong, their place in the scheme of things and the place of various

components of their way of life once seemed reasonably secure. Now that has been challenged by war and resettlement in an alien society. (p. 6).

The Hmong spiritual attitude of the wholeness of life points in the direction of field dependence as a Hmong learning style.

Effect of the War Years

In 1955 the traditional life the Hmong had lived for centuries was thrown into the crucible of change. For the next 20 to 30 years their people would be stressed by war, by attempts of their enemies to annihilate them, and by resettlement as refugees in places that seemed to many of them as unlike their homeland as the moon. The way of life that had served them well for the whole history of their people would be tested by events they had never foreseen. In 1955 the Laotian civil war began. As Pathet Lao (communist) forces fought with the Royal Lao army throughout Laos, the Hmong, following Hmong leaders they trusted, were divided as a people and joined both sides of the conflict.

As the conflict increased in the early 1960s, the American CIA became secretly involved in Laos, supporting the Royal Lao forces and recruiting large

numbers of Hmong to fight against the North Vietnamese whose convoys passed through the home provinces of the Hmong to carry war supplies along the Ho Chi Minh Trail to South Vietnam. Hmong families began to feel the effects of the war. Because their mountain villages were located in the heart of the conflict, many Hmong were forced to leave their homes to relocate in war "conglomerations" (protective settlements) often found near military centers (Smalley, 1986, p. 10). The dangers of war, uncertainty, and a new environment at lower altitudes made traditional farming impossible to practice, and the Hmong began to depend on the United States Agency for International Development (USAID) to fly in the food necessary for their survival. This period of resettlement was a particularly difficult time for the Hmong, and as a result, many elderly people and young children died.

As the war increased in intensity, more Hmong men and boys left to join the fighting. Heads of households were killed in action, and women took on the responsibility for what food production could be managed under such difficult conditions. From 1969 to 1973 the fields surrounding Long Tieng and Sam Thong, two large relocation centers, were not planted "because

both towns were frequently attacked by the Pathet Lao and North Vietnamese and all the civilians had been evacuated" (Yang See Koumarn, 1979, p. 8).

Although war produced conditions damaging to the Hmong social structure and caused endless hardship and grief for many families, it did end the isolation of the Hmong and propelled them into the 20th century. The technology of war became part of everyday life. A number of Hmong men learned to speak English in order to communicate with the American CIA. In the relocation areas schools were started for the children, trading began as men were paid for their soldiering, and small businesses such as food stands, taxi services , and clothing shops (Kansier, Williams, Giel, & DeMarre, 1980) sprang up. In many households,

> the older members of the household, who were unable to work in the fields, would preside over the shop; the able-bodied men would join the army to earn cash; and the remaining members of the family -- the women and children -- would work in the fields. (Yang See Koumarn, 1979, p. 13)

The war, however, took a huge toll. An estimated 30,000 to 50,000 Hmong, between 10% and 14% of the total Hmong population, was killed (Williams, 1978; Morin, 1983).

Then, in the spring of 1975 soon after the fall of Saigon, the world that had started tailspinning for the Hmong in 1955 crashed. With the fall of the Royal Lao government and the victory of the Pathet Lao, came harsh reprisals against the anti-communist Hmong. Following the end of the war and the pullout of the Americans came destruction of Hmong villages, deportation of many men and youth to re-education camps, harrassment of Hmong settlements, the dropping of poisonous chemical "yellow rain" onto Hmong villages, and in three years time the killing of 14,000 Hmong. By 1978 it appeared that the 50,000 North Vietnamese occupiers of Laos were engaging in a deliberate policy of genocide against the Hmong (Williams, 1978). By 1983, an estimated 70,000 Hmong in Laos had been killed by the communists (Morin, 1983). The Hmong, by staying in Laos, risked extinction.

Refugee Camp Internment

Thus began the next stage in the lives of many Hmong, the escape to refugee camps in Thailand. The first wave of Hmong to leave Laos left immediately in 1975 following their leader General Vang Pao. As the years went by, more followed. According to Olney

(1986), over 110,000 Hmong have left Laos since 1975, with about 52,000 of these remaining in seven refugee camps in Thailand. Most recent data indicates that 84,000 Laotian (including Hmong) refugees are massed along the Laotian/Thai border (Hamburger, 1987). In the first stage of flight, many families fled to the jungle to hide from the communists and when the time was right (often months or even a year later) crept clandestinely over the mountains and swam or rafted the mile-wide Mekong River into Thailand during dangerous fear-filled nights. During escape families were often separated; beset by hunger, illness, and ambushes of the Pathet Lao and North Vietnamese soldiers, as many as a third of those who started these journeys died on the way (Pringle, 1979). Many sources state that it can be safely assumed that every Hmong in the United States has lost at least one and often more close family members. By 1979 the American press was talking about the "end of the Hmong" (Pringle, 1979).

Once into Thailand, the Hmong became refugees who surrendured to Thai soldiers and were interred in camps near the Thai/Laotian border. Conditions in camps varied. In some, the Hmong were able to maintain a semblance of village social organization, but for many

the chaos of their escape had separated them from people they knew, and upon arrival they became isolated in small incomplete family units. Williams, in describing a visit to one of these camps in 1978, said,

> Nevertheless, a visit to Nong Khai is a sobering and troubling experience. It is not the overcrowding, the stifling heat and the minimal living conditions. It is rather because these proud and independent people are condemned to live in a state of suspended animation. They cannot return to the mountains of Laos. The Thai government will not let them settle in Thailand, and other countries such as the United States accept only a few of them after long delays, and most of them not at all. So everywhere one sees bright, hopeful families of farmers who are not allowed to farm, fighters who have no means to fight, workers with no chance to work. Active men and women, including many wounded in battles fought at U.S. insistence and for U.S. causes, are being left to stew in enforced idleness. (p. B5)

According to Camp (1981), many Hmong spent anywhere from one to four years in a refugee camp fighting hunger, boredom, depression, and anxiety as

they waited for a future to materialize. In a 1982 survey of 3000 Hmong living in an urban center in the western United States, 54% of those surveyed had spent from two to five years in refugee camps (Reder, 1982). In the camps, overcrowding, poor sanitation, a barely adequate supply of food, only the most basic medical services, and lack of meaningful activity bred physical and mental health problems (Harmon, 1979). Many spent their days grieving for loved ones who had lost their lives in the escape attempt and thinking of family members left behind in Laos. Ellis (1980) reports that Hmong in the refugee camps were "apathetic, listless, not smiling, reticent, and lacking in energy and initiative. . . . Hmong were isolated together in the most overcrowded . . . camps" (p. 78). People who are forced to stay for extended periods of time in camps such as the Thailand refugee camps "face a growing challenge: that of camp syndrome, described as being too many people, in too small a space, for too long a time, with too much uncertainty," according to Ray (1985, p. 79).

Camp life was also difficult for the Hmong children. High rates of malnutrition in children were reported (Pringle, 1979). In 1979, clinics in San

Francisco found tuberculosis in 40% of the refugee children who entered the country there (MacFarquhar, 1979). Makeshift schools for children existed in some camps, but most children because of long periods of hiding in the jungle and then long stays in the refugee camps did not attend school for years. In the camps, they relied primarily on aural/oral communication (Rubin, 1981); in 1982 most Hmong 10-year-olds in refugee camps in Thailand were illiterate (Knop, 1982). Reder (1982), however, reports that the older school age population (12-19) was relatively more literate in Hmong, which Alter (1982) interprets as the result of informal study of Hmong reading and writing in the refugee camps.

The most important factor affecting children, however, was the psychological atmosphere of the camp. Ray (1985) states that the refugee experience is one of extreme loss, and explains that

> the difficult paths leading to the first asylum camps are literally "trails of tears," during which not only lives are lost but as the shock of initial traumas fade, come the horror and disorientation associated with the loss of family, community, culture and hope. (p. 78)

Children who had watched family members die in Laos and during escape, now watched more die in the camps. One Hmong high school student in St. Paul, Minnesota remembered the camp he had lived in as a "jungle of death" (Smith, 1984).

Effects of Emigration to the U.S.

Refugees who wished to emigrate to the United States had to pass through a rigid screening procedure to prove their eligibility for the U. S. resettlement program. Categories of eligibility ignored Hmong social structure and the critical importance of the extended family. War and postwar conditions made it difficult and often impossible to secure the documentation required by U.S. immigration officials, and after 15 years of armed conflict and the loss of over 30,000 lives, many Hmong were denied the chance to begin productive lives (Kansier, et al., 1980).

Eventually, the Hmong began to leave the camps. A large number of them came to the United States, where new problems awaited them. Yao (1985) reports some of the problems refugees face upon arrival in a new country. Family cohesiveness diminishes, particularly in the extended family. The father's role as patriarch is threatened. Many refugee women become heads of

households because their husbands were killed or left behind. The child's place in the family changes as the culture of the host country impacts the child through school. Often the younger children in the family learn the new language faster than other older family members, and become the interpreters for the family. "Everything of the old days is up for grabs," says Kay Heyer, a nurse who worked in the refugee camps in Thailand (Blinkhorn, 1987, p. 14). Hmong young people, although they still respect their parents, rely more on each other, especially cousins from the same clan for help in dealing with the American culture and educational system.

In the United States, the traditional social structure of the Hmong which had been disrupted by the force of the war and years in the camps was further threatened. Extended families were often resettled in geographically distant places. The Hmong, more than any other refugee group, however, has contended with this problem by relying on the strong clan structure that had served their people since early in their history. Secondary migration brought Hmong families together, and Hmong formed a number of large communities across the nation where they could be in

close contact with each other. Dunnigan (1982) describes the kinship ties reestablished by the Hmong in St. Paul and Minneapolis, where over 10,000 Hmong have migrated. Within the sub-lineage groups that are the basic unit of sociocultural adaptation, younger men are given more responsibility than they had in Laos, primarily because they have learned to speak English and can be of service to the Hmong community in dealing with non-Hmong persons. Families try to maintain close ties, but encounter difficulty when young adults feel that they do not need family support, and do not submit to family discipline.

Nevertheless, Hmong parents are trying to maintain the close ties they have traditionally had with their children. A study of Hmong mothers in Hennepin county found that they were more sensitive and attentive to their infants and toddlers than Caucasian mothers. The sensitivity of the Hmong mothers seemed related to a "cultural priority for attentive child-rearing and the availability of a strong extended family network" (Oberg, et al., 1986, p. 413). Parents of Southeast Asian children in Des Moines, Iowa were able to concentrate better and learn more in an English-as-a-Second-Language program when their children were

nearby in the next room rather than being left at home (Johnson, 1985).

Although Hmong parents don't very often understand the intricacies of the American school system, they seem to realize the importance of formal education for success in the American society, and "with courageous realism and genuine concern for the well-being of the younger generations, . . . encourage the young in their efforts" says Geis (1981, p. 12). A large number of Hmong students whom this researcher knows report the philosophical support their parents give them to attend college. Geis says that Hmong children come to school in the U.S. poorly prepared educationally but with the "kind of values and self-discipline which makes them excellent students" (p. 12) The assistant principal of an urban high school attended by large numbers of Hmong told this researcher that all the teachers wanted the homerooms at the end of the alphabet because those were the homerooms with the most Hmong students.

Hmong Learning Styles

The learning styles of Hmong students have been observed informally by many teachers. Alter (1982) reports that the Hmong student is passive, and not accustomed to dealing with abstractions. At first, the

child probably does not speak any English, and often upon first contact with school is frightened by the experience. Radically different ethnic backgrounds of teacher and refugee students cause them to bring vastly different expectations to the classroom (Lert, 1980). According to Cohon (1980), teachers who want active student participation in contrast to "an Indochinese learning style which is receptive" will end up in a conflict of values (p. 8). Non-English speaking children often have low self esteem when they arrive in the United States (Arnold, 1982), and suffer difficult adjustment because of the traumatic experiences they have suffered in the past. One 10-year-old Vietnamese refugee in writing his own alphabet book, wrote "B is for bombs. I saw the bombs drop from the planes to the houses. G is for gun, and K is for kill" (Mackey, 1982, p. 98).

Several studies which relate directly to this study have been completed. A descriptive study by Lert in 1979 that examined the role of learning environment to language acquisition by adult Hmong immigrants found that their learning styles included a dependence on mimesis (memorization), identification with the teacher, and peer influence, group support, and

cooperation. Lert reported that one student in the study, whenever visited at home by his teachers would precede each lesson by serving them 7-Up. Lert interprets this as more than a hospitable gesture. She explains "I felt . . . a major function of the activity was to establish a personal bond between the members of the household and the teachers, which was facilitated by the acceptance and consumption of the soda" (1980, p. 35).

Cornell (1983) reports that Hmong workshop participants at the Conference on Hmong Resettlement in the U.S., sponsored by the Lao Family Community identified the need for American teachers who use Hmong teaching techniques including copying, memorization, and repetition. She recommended that the learning styles of refugee students should be studied to determine if there is a style common to all members of an ethnic group or whether learning styles reflect the individual.

Boss (1983) studied the influence of cultural values on the classroom behaviors of eighteen adult Vietnamese refugees. With the technique of classroom observation, she found that the Vietnamese students exhibited reflective, field dependent, analytical

behaviors. Since no instrument was used to measure field dependence, it is difficult for this researcher to judge the results of this study as completely accurate. Analytical behaviors usually don't accompany a field dependent learning style; the study needs to have been accompanied by data from some instrument designed to test the field dependence factor.

In a study of 50 Laotian and Vietnamese refugee children in Utah, results indicated that the group was 34% right brain dominant, 40% mixed brain dominant, and 26% left brain dominant (Ruangthai, 1984). Using a researcher-designed instrument which was a series of questions designed to provoke lateral eye movement that would indicate hemispheric dominance in the individual being questioned, Ruangthai's study was conducted on a relatively small number of Laotian students (n=24), who could have been a mixture of Lao, Hmong, and other ethnic minorities from Laos. The characteristics of the group were unclear. While the concept of brain dominance seems to have implications for learning style, the relationship between the two concepts was not clearly defined in this study.

Hvitveldt's microethnographic study (1982) of 13 Hmong adults in an English-as-a-Second-Language program

in Madison, Wisconsin found that the learning styles of the group tended to be highly field dependent when measured with the Children's Embedded Figures Test and the Draw-a-Person Test. The Embedded Figures Test was administered to some of the students, but was found to be so difficult that no spread of scores was obtained within the group.

In regard to student roles and teacher roles, Hvitveldt found that the central student perception of their role was defined in terms of classroom work as a cooperative group activity. Classroom achievement was always regarded as the result of cooperative effort and never as the result of individual initiative. She reports, "Not only is there no competition in the classroom, there is constant denial of individual ability" (p. 70). Students requested and received explicit direction and continuous approval. They looked to their teacher and other classmates as external referents, rejecting any attempt on the part of the teacher to democratize the decision making process.

Hvitveldt's study, while of the learning styles of Hmong students, was conducted with subjects who were primarily illiterate adults who had spent no time in

American schools. While it does have direct relevance to this study, Hvitveldt's research examined a very different population than this study does.

A large case study by Sonsalla (1984) of the secondary programs for Hmong students in the St. Paul and Minneapolis public school systems used informal interviews, document search, in-depth interviewing, questionnaire survey, and analysis of data. Respondents in both school districts identified the Hmong characteristics of hard work, respect for authority, desire for education, ambition and industry as traits enhancing learning. Shyness was the trait identified by respondents as most hindering to Hmong educational success. Sonsalla states,

> Hmong secondary school students, unlike the typical American adolescent, had survived the horrors of war, had experienced the calamities relating to a forced exodus to escape extermination, had participated in the rigors of a controlled refugee camp, had dealt with the bureaucratic entanglements involved in the placement and acceptance into the United States, and had shared in the burden thrust upon the Hmong

> parents as they sought the basic needs of food, shelter and clothing. (p. 274)

Although this study identifies many characteristics of Hmong secondary students, it does not discuss the learning styles of those students.

Numerous sources identify the interest of the Hmong in gaining education in order to succeed in their new homeland. Many studies also identify the difficulties Hmong students and other refugees will face in gaining an education. Based on a nationwide telephone poll, 300 to 400 Hmong students (less than 5% of the Hmong college age population) attend college full-time (Cohn, 1986). This population seems to be growing as more Hmong youth finish high school and, encouraged by their elders, seek to gain further education and economic success.

Summary

Traditional, tightly-structured, preliterate agricultural societies that socialize their members to obey and conform have been found to encourage field dependence in children. The Hmong seem to be such a society. The Hmong have been found in one microethnographic study of 13 adults to tend to be field dependent. However, the literature does not

include many studies of the learning styles of younger Hmong secondary and post secondary students. There is a need for research to examine Hmong learning styles in order to be able to develop effective instructional methods and materials for teachers to use with Hmong students.

This study proposes two hypotheses. The first hypothesis is that Hmong male students, 17-years-old and older, who are attending or planning to attend post-secondary educational institutions will tend to be field dependent. A review of the literature on field dependence/independence and the cultural impact on learning style, as well as the literature on Hmong culture, supports this hypothesis.

It is not clear from the literature, however, to what extent acculturation has affected Hmong youth living in the United States. It may be that contact with the U.S. culture, especially through formal schooling, has affected the learning styles of Hmong students and that they will exhibit learning styles less field dependent than expected.

The second hypothesis is that the problem solving strategies of Hmong students will reflect their learning styles. It would appear from the literature

on learning styles and the theory of psychological differentiation that students who tended to be field dependent would also tend to use global problem solving strategies, and, therefore, that the second hypothesis is also supported by the literature.

Discovering the learning styles and problem solving strategies of Hmong students could make it possible for these students to learn difficult material in a more efficient way. The accumulation of the literature presented in this review points to the efficacy of a study of Hmong learning styles and problem solving strategies. This researcher could find no other study that had studied the learning styles of Hmong students attending or interested in attending post secondary educational institutions.

Chapter III

RESEARCH METHOD

Introduction

A review of the literature indicated that the learning style factor most studied cross-culturally is field dependence/independence. To study this factor would make possible comparison with other cultural groups. Although other learning style factors could have been examined, the researcher noted important limitations of a number of learning style models in regard to their use in this study. Many of these limitations involved the importance of the use of language in the models.

In this study 42 Hmong male students, 17 to 36 years old, who were attending or planning to attend a post secondary school, were first tested to determine their learning styles and then interviewed to determine their problem solving strategies. The first variable was the learning style factor of field dependence/field independence, and the second variable was the problem solving strategy.

Research Questions and Hypotheses

Answers to the following questions were sought:

1. To what extent are Hmong students field dependent or field independent in learning style?
2. To what extent are the problem solving strategies of Hmong students global or analytical?
3. Do the problem solving strategies of Hmong students correlate with their learning styles?

These research questions and a review of the literature led to the development of the following hypotheses:

1. It was hypothesized that Hmong male students 17 years old and older who are attending or are planning to attend post secondary educational institutions would be predominantly field dependent in learning style as measured by their performance on the Group Embedded Figures Test.
2. It was further hypothesized that the problem solving strategies of Hmong male students 17 years old and older who are attending or planning to attend post secondary educational institutions would be predominantly global as assessed by personal post-test interviews with

each student about how he approached the task of problem solving on the Group Embedded Figures Test.

3. It was furthered hypothesized that Hmong students who measured field independent in learning style would choose analytical problem solving strategies to accomplish the test, and that students who measured field dependent in learning style would choose global problem solving strategies to accomplish the test.

The relationships specified in the research hypotheses were restated for testing purposes in the following null hypotheses:

Ho_1: There is no significant difference as measured by t-test for independent means between the mean score of Hmong students in this study on the Group Embedded Figures Test and the mean score for American college males on which the Group Embedded Figures Test was originally normed.

Ho_2: There is no significant relationship as tested by chi-square between field dependence/independence as indicated by

scores on the Group Embedded Figures Test and global or analytical problem solving strategies as indicated in post-test interviews.

Relationship of Method and Procedures to Hypotheses

The hypotheses of this study stated the requirement for the following data: the learning styles of the subjects (particularly the factor of field dependence/field independence) and the problem solving strategies of the subjects (particularly the strategies involved in performance on a difficult task). The hypotheses also stated the requirement for correlation of the learning styles and the problem solving strategies of the subjects. The Group Embedded Figures Test provided data on the learning styles of the subjects, and individual interviews provided data on the problem solving strategies of the subjects. Once these two factors were determined, the degree of their presence in the subjects of the study was correlated.

Description of Subjects

Subjects for this study were volunteer Hmong male refugee students, 17 to 36 years old, who were attending or planning to attend post secondary

educational institutions. The following schools from Wisconsin and Minnesota were represented: University of Wisconsin-Stout, University of Wisconsin-Madison, Fox Valley Technical Institute, Eau Claire North High School, Appleton East High School, Wausau East High School, Green Bay West High School, Oshkosh North High School, University of Minnesota, Inver Hills Community College, North Central Bible College, Lakewood Community College, St. Thomas College, St. Cloud State University, Concordia College of St. Paul, Johnson High School, Central High School, Highland Park High School, and Como Park High School.

Of the 42 subjects, 35 were between 17 and 21 years old, and 7 were between 23 and 36 years old. Grade levels from 11 to 15 were represented. Of the 42 subjects, 15 were high school students, and 27 were college, community college, or vocational/technical school students. Cumulative grade point averages (GPAs) ranged from 1.0 to 3.75, with a mean GPA of 2.9.

All of the subjects were born in Laos. Some of the subjects had come to the United States as relatively young children, others had come as adolescents, and still others as adults. The most recent arrivals to the United States had come as late

as December, 1986; on the other hand, several had come as early as May, 1976. The average number of years lived in the United States was 5.9 years, with 34 subjects having been residents of the United States for six or more years.

Subjects had spent from less than one year in a refugee camp to nine years in a refugee camp. Of the 42 subjects, 19 had spent four or more years in a refugee camp. Only four of the subjects had experienced uninterrupted schooling (missing no grades from grade 1 to 12); two of these four subjects were the two oldest subjects of the study, who because of their ages had had the opportunity to finish both elementary school and high school in Laos before the war had become intense enough to disrupt schooling as it did later. Eight of the subjects had never gone to school before entering the United States, and 19 more had only from one to three years of formal schooling before entering the United States.

College majors chosen by the subjects ranged from business administration and applied math to psychology, Christian cultural ministry, and medicine. Of the 42 subjects, 20 had chosen majors in the field of technology, including electronics engineering,

industrial technology, computer technology, and graphic arts management among others. Math was mentioned as a favorite subject by 22 of the subjects; many interviewees indicated to the researcher that doing well in math didn't depend as heavily on English skills as other subjects did. Nevertheless, English was mentioned as a least liked subject by only four of the subjects; it was mentioned as a favorite subject, on the other hand, by 12 of the subjects.

Subjects from the age of 17 were included in the study because research has shown that the learning style factor of field dependence/field independence stabilizes at age 17. From that age on, field dependence/independence remains constant over the lifetime until late in life when sometimes the individual becomes relatively more field dependent. The researcher was interested in determining the learning styles and problem solving strategies of students who were about to enter post secondary school as well as those who had already entered post secondary school.

Only males were chosen for the study since research has shown that females tend to be relatively more field dependent than males of the same cultural

group. A mixed group of subjects would have necessitated using separate norms for males and females. Also, very few Hmong females are presently attending post secondary educational institutions (at University of Wisconsin-Stout, of 34 Hmong students, only one is female).

Selection and Development of Instruments

Extensive study of a variety of learning style inventories and instruments led the researcher to choose Witkin's learning style model in which field dependence/independence were the factors to be measured. Many of the instruments used by other models relied heavily on the use of abstract words that may have held connotations and denotations for native speakers of English but not for Hmong who spoke English-as-a-Second-Language. None of the instruments designed by Witkin and his associates depended on the use of language by the subject to be tested. Therefore, the Group Embedded Figures Test (GEFT), developed by Witkin, Oltman, and Raskin in 1971 to provide screening on the field dependence/independence dimension, was chosen as the instrument to measure learning style in this study.

The Group Embedded Figures Test

An adaptation of the individually administered Embedded Figures Test (EFT) developed by Witkin, the Group Embedded Figures Test, seems to be an appropriate instrument for cross-cultural studies of the factor of field dependence/field independence.

The GEFT was modeled very closely on the EFT with regard to mode of presentation and format. Both the EFT and the GEFT are non-verbal tests which may be applied to groups with native languages other than English and that contain individuals of differing verbal facility. These characteristics made possible the use of the EFT (and then later the GEFT) in cross-cultural studies that included cultures very different from that of the United States. Cross-cultural studies cited by Witkin in Berry and Dasen (1974) have successfully applied tests of field dependence to a variety of non-Western indigenous groups.

The GEFT makes possible the testing of many individuals within a single testing session. Administration time for the GEFT is approximately 20 minutes.

The GEFT contains 18 complex figures (17 of which were taken from the EFT) in each of which are embedded any one of eight simple forms. The test is presented in the form of a booklet. The eight simple forms are presented on the back cover of the test; the subject, therefore, is prevented from seeing simultaneously the simple form and the complex figure in which it is embedded. The subject may, however, look at the simple forms as often as he wishes by simply turning to the back cover.

The GEFT presents the subject with three timed sections. Section One, which contains seven very simple items and has a time limit of two minutes, is intended for practice, and, as such, is not scored. Sections Two and Three each contain nine considerably more difficult items and have time limits of five minutes each. These two sections are scored, with a total possible range of scores from 0 to 18. An individual's score is the total number of simple forms correctly found and traced in pencil in Sections Two and Three of the test.

In determining the validity of the GEFT, the most direct measure is the parent form of the test, the EFT. Correlation between the GEFT and the EFT in a study of

male college undergraduates (n=73) was -.82, which indicates high correlation since one test is positively scored and the other test negatively scored (Witkin, et al., 1971).

Correlation with the degree of articulation of body concept (ABC) which is measured by the ABC scale is .71, a substantial correlation (Witkin, et al., 1971).

Correlation with the Portable Rod and Frame Test (PRFT), -.39, was not high in a study of male undergraduates (n=55) (Witkin, et al., 1971).

Since the GEFT is a speed test, reliability may be measured by discovering the correlation between parallel forms with identical time limits. Correlations between the nine-item Second Section scores and the nine-item Third Section scores in a group of both males (n=80) and females (n=97) produced a reliability estimate of .82 for both groups. These reliability correlations compare favorably with the .82 and .85 reliability coefficients found for the EFT in two groups of college students (n=51) and (n=150) (Witkin, et al., 1971).

Witkin and others (1971) state that this evidence suggests that "the GEFT may prove to be a useful

substitute for the EFT when individual testing is impractical" (p. 29). According to the manual (Witkin, et al., 1971), the GEFT, however, is to be considered a research instrument until more extensive validation data are collected from a wider variety of groups.

Several problems exist in using the test, however. One problem with the GEFT is that no further validation data has been included in the manual which was published in 1971. Another is that normative data developed for the GEFT was based on small samples of Eastern liberal arts college men (N=155) and women (N=242) and is minimal data. These norms may not be appropriate for subjects of cross-cultural studies. Although Goodstein (1978) states "the GEFT is a different and potentially powerful approach to tapping one of the cognitive style dimensions of human personality" (p. 838), a study by Renna and Zenhausern (1976) demonstrated that the GEFT norms published in the GEFT manual cannot be universally applied to populations other than the norm group, and even to a comparatively similar population. Goodstein states,

> While clearly the test is not yet ready for use on an individual basis, it does appear to be a well-conceptualized and well-researched

> instrument. Its current use, however, will depend more upon the cognitive or research style preferences of psychological researchers than upon the psychometric characteristics of the instrument. (p. 838)

Panek, Funk, and Nelson (1980) in a study of the reliability of the GEFT across the life span found that the test has adequate split-half reliability and validity as estimated by measure of internal consistency. Significant, consistent differences in performance on Part Two and Part Three were found. Data supported construct validity for the over-all group for Part Two, Part Three, and Total Score, but each age group tested did not demonstrate clear construct validity.

A study by Carter and Loo (1979) suggests that norms for the GEFT must be updated to include the various populations upon which the test is used. This updating would have been beneficial to this study.

It has been argued that the GEFT is not a measure of cognitive style, but a test of ability (indeed, the test correlates highly with the Block Design of the Wechsler tests) and as such assesses "acquired" ability (Ghuman, 1980, p. 84).

The GEFT, however, is being used in more and more studies in which groups of subjects are measured for field dependence/field independence. Because of its wide use, because performance on the test does not depend on knowledge of English, and because validity and reliability of the test are acceptable, it seemed to be the most appropriate instrument to measure field dependence/field independence in this study.

Researcher-Designed Interview Protocol

The second means of data collection used in this study was an individual interview protocol consisting of open-ended questions regarding the problem solving strategies used by the subjects in taking the GEFT. Because very specific information about the problem solving strategies of each student was sought, conducting individual interviews was selected as the most appropriate method to discover problem solving strategies. The Group Embedded Figures Test was chosen as the difficult task which every subject would have completed. Even for highly field independent individuals, the GEFT presents a challenge. Very open-ended questions about taking the GEFT allowed subjects of the study complete freedom to identify ways

in which they attempted to solve the embedding problems presented by the test.

The researcher-designed set of interview questions was used to give a wide variety of data that could be best obtained through personal contact. Questions which would cause the subjects to metacognate (i.e. think about their thinking process) were selected. The following questions were included on the interview protocol:

1. On a scale of 1 - 5, with 1 = very easy and 5 = very hard, rate the difficulty of the GEFT.
2. Did you feel frustrated while taking the test? If so, what did you do?
3. How did you find the shapes? What did you do to find them? Can you tell me what you were thinking when you looked for this shape (interviewer indicated a specific item that had been completed by the subject)?
4. Did you use the same strategy throughout the whole test? Please explain.
5. When you are faced with something difficult to figure out, how do you usually like to go about figuring it out?

Data from the interviews was gathered by counting and classifying all responses to questions 3 and 4. Questions 1 and 2 were designed to find out if the experience of taking the GEFT was actually a challenge. Question 5 was designed to help subjects elicit more information for answers to question 3. After all subjects had been interviewed, the researcher noted all problem solving strategies identified by all subjects. Because strategies identified in this study were situation-specific, no classification of these strategies could have been presented in any literature. Since the concept of psychological differentiation could apply to a situation as specific as an individual taking the Group Embedded Figures Test, this researcher decided to classify all situation-specific problem solving strategies mentioned by subjects interviewed in this study as global or analytical.

Classification of all strategies as either global or analytical was based on the following criteria: the extent to which the strategy relied on searching for whole units, the extent to which the strategy relied on further embedding the simple form by placing it in a meaningful context, the extent to which the strategy broke the problem into subparts, the extent to which

the strategy imposed an external structure or organization such as sequencing on the problem, the extent to which the strategy structured the problem to include the perception of elements such as symmetry and measurement as useful tools.

Strategies which relied on searching for whole units (i.e. the simple forms A-H specified on the GEFT) and further embedded the form by placing it into a meaningful context by giving it a name (e.g. simple form D = a house, simple form E = a box, simple form F = a tie, etc.) were classified as global problem solving strategies.

Strategies which broke the problem into subparts by searching for a discrete part of the simple form in the complex figure (e.g. a right, or acute angle at the top of the simple form), which organized the problem by a sequential search (e.g. starting at the top or bottom or center, etc. of the complex figure), which included symmetry and measurement as tools (e.g. counting boxes on either side of the center of an embedded simple form, estimating the length of a certain line, estimating proportion of certain parts of a simple form) were classified as analytical problem solving strategies.

During interviews subjects identified the following problem solving strategies as means by which they attempted to complete the items on the Group Embedded Figures Test:

Global Strategies

1. Holding an image of the whole simple form in their minds and searching for that image in the complex figure.
2. Naming the simple form with a name that would make it easier to remember (e.g. box, school, house, tie, etc).

Analytical Strategies

1. Identifying and searching for a distinctive part of the simple form.
2. Matching a specific angle from the simple form with possible locations in the complex figure.
3. Measuring lines by counting boxes or judging measurement with their pencils.
4. Taking note of symmetry and proportion in the simple forms and searching for possible locations in

the complex figure in which they could be duplicated.

5. Noting a familiar shape (e.g. right triangle, square, etc.) in a portion of the simple form and searching first for that shape in the complex figure.
6. Searching for the simple form sequentially in the complex figure (e.g. starting in the center, at the corner, on the lowest horizontal line, etc.).

Once interview data was classified, a determination was made of whether subjects primarily used global or analytical learning strategies. Students who reported more global strategies than analytical strategies were classified as global problem solving strategy users, and students who reported more analytical strategies than global strategies were classified as analytical problem solving strategy users. Three subjects reported an equal number of global and analytical strategies; these three students were reinterviewed to determine if any of the strategies mentioned should be weighted more heavily

than any of the others. Indeed, this proved to be the case for all three.

Procedures for Data Collection

Subjects were volunteers. Of the 42 subjects, 13 were members of the Lao Family Community in St. Paul, Minnesota, 19 were students participating in summer enrichment programs at the University of Wisconsin-Stout, and 10 were UW-Stout students enrolled during the regular academic year.

Groups were tested and interviewed in either of two places -- the Academic Skills Center at the University of Wisconsin-Stout in Menomonie, Wisconsin and the meeting room of the Lao Family Community in St. Paul, Minnesota. The researcher explained to each group that by taking the test and talking with the researcher after the test, the subjects would help the researcher in an attempt to discover "good ways to teach Hmong college and vocational school students."

Subjects first completed a questionnaire to provide demographic information (Appendix A.1). They were then tested in small groups of from 2 to 14 with the Group Embedded Figures Test. Four subjects were individually tested. No tests were scored before interviews to help prevent interviewer bias. Following

the GEFT testing, each subject was privately interviewed in English regarding the problem solving strategies he used to find the simple forms embedded in the complex shapes on the GEFT (Appendix A.2). Interviews lasted from 10 to 25 minutes depending on how much the subject expanded on interview questions and on how many subjects had been tested in the group. The researcher made every attempt to provide an informal, relaxed atmosphere for the interviews. All interviews were conducted in a private room away from the group.

During each interview, the researcher and the subject sat at a table with the subject's Group Embedded Figures Test booklet between them. At first, the subject was encouraged to speak in general terms about the problem solving strategies he used in taking the test. As the researcher asked more questions, she indicated certain items on the test to give the student a concrete example to discuss in relation to the question. If the researcher were not sure she understood a certain answer, she asked the subject to show her what he meant by pointing to something in the test booklet that would clarify his answer. In this way, an attempt was made to make what could have become

a very abstract dialogue as concrete as possible. As subjects explained the procedures they used to find the simple forms on the test, the researcher took notes. Near the end of many interviews subjects volunteered information that had not been covered in the interview questions.

While subjects of larger groups waited for their turn to be interviewed, they were provided with a variety of activities from magazines to read to a Charlie Chaplin film to watch. Subjects were asked not to discuss the GEFT with each other while waiting to be interviewed. The longest waiting time for any subject to be interviewed was two and one half hours.

Procedures for Data Analysis

Data from the Group Embedded Figures Test was obtained by first determining the score of each subject on the test. High scores on the GEFT indicate a stronger tendency toward field independence; low scores indicate a stronger tendency toward field dependence. The score of each subject was compared to the mean for the norm group to determine if the subject's score fell above or below the mean. In accordance with the published norms, subjects with scores of 13 and above were classified as field independent, and subjects with

scores of 12 and below were classified as field dependent.

Data analysis to determine if the subject group of this study was field dependent was computed with the University of Wisconsin-Stout Academic Computing Center's center-designed FISHER t-test program using a two-tailed t-test for independent means to determine statistically significant differences between the mean scores of the Hmong and the norm group. Frequency counts, percentages, mean, median, minimum, maximum, and standard deviation of the GEFT total score was computed using SPSS-X FREQUENCIES.

The University of Wisconsin-Stout Academic Computing Center's program SPSS-X FREQUENCIES was used to determine frequency counts and percentages for the variables of imaging the whole simple form, naming the simple form, searching for a distinctive part, searching for an angle, measuring, using symmetry and proportion, sequencing, and problem solving strategy type. The computer program SPSS-X CROSSTABS was used to determine relationship between the Group Embedded Figures Test-identified learning style (FD or FI) and the interview-identified problem solving strategy type

(global or analytical) using the chi square statistical analysis.

The University of Wisconsin-Stout (Menomonie, WI) Academic Computing Center's Statistical Package for the Social Sciences-Version X (SPSS-X, 1983) was used to conduct a two-tailed t-test for independent means and to determine statistically significant differences between the group of field dependent subjects and the group of field independent subjects. This and other data are presented in tables in the following chapter.

Methodological Limitations

This study was limited in so far as the subjects were not randomly selected. However, it was assumed from the outset of the study that the subject group was representative of Hmong students in general. An attempt was made to assure that subjects in this study came from a wide variety of schools.

A further limitation to this study was the lack of control for educational background of the subjects. Some subjects had attended formal schooling for longer than others and may have had more practice taking tests. All subjects in the study, however, had attended some formal schooling and had taken pencil and paper tests before. Furthermore, the GEFT includes a

practice section to insure that all subjects understand how to take the test. The researcher was very careful to check that all subjects in every group understood the directions for the test before Sections Two and Three (the scored portions of the test) were begun.

Although the study was also limited in the fact that tests and interviews were administered in more than one place, similar conditions existed at both testing sites. Both sites were equally quiet. Interviews at both sites were conducted in private rooms.

The study was limited in that directions for the test were administered in English and interviews were conducted in English. Only one subject seemed to have difficulty understanding the interview questions (a subject who had only been in the United States for six months), and another subject who had exhibited a high level of English and had lived in the United States for seven years helped translate questions and answers from Hmong to English and English to Hmong for him.

Summary

Hmong male students (n=42), 17 years old and older who were attending or planning to attend post secondary educational institutions, were tested to determine

their learning styles in regard to the factor of field dependence/field independence. Subjects were then individually interviewed regarding their problem solving strategies. The Group Embedded Figures Test and researcher-designed open-ended interview questions were the instruments used to gather data about the sample group. Analysis of the data was done by the researcher through the University of Wisconsin-Stout Academic Computing Center using the computer programs Statistical Package for the Social Sciences-Version X (SPSS-X, 1983) FREQUENCIES AND CROSSTABS and the computing center designed program FISHER for two-tailed t-test for independent means for analyzing statistical information.

Chapter IV

RESULTS AND DISCUSSION

Introduction

This study had a threefold purpose: to study the learning styles of the Hmong, to study the problem solving strategies of the Hmong, and to study the relationship between these two variables. The first purpose of this study was to identify the learning styles of Hmong male students aged 17 years and older who were either attending or planning to attend a post secondary educational institution. The factor of field dependence/field independence was the learning style factor to be examined. Second, this study also sought to identify the problem solving strategies chosen by the same individuals when faced with a difficult task. Global and analytical problem solving strategies were the strategies to be examined. Third, the study attempted to assess the relationship between the learning styles and the problem solving strategies of the subjects.

Findings

With respect to this purpose and the hypotheses stated in Chapter I, the following statements may be

made on the basis of data gathered and analyzed in the study:

1. A two-tailed t-test for independent means performed on the group mean of the Hmong subject group and of the norm group indicated that a significant difference did exist ($p < .01$). Therefore, the first null hypothesis, Ho_1, was rejected.
2. On the basis of scores for the Group Embedded Figures Test and data regarding problem solving strategies collected in post-test interviews, chi square statistical analysis indicated a significant relationship between field dependence/independence and global or analytical problem solving strategies of Hmong subjects ($p < .001$) Therefore, the second null hypothesis, Ho_2, was rejected.

In an effort to check the homogeniety of the field dependent and the field independent groups for the Group Embedded Figures Test, a two-tailed t-test for independent means performed on the scores of the field dependent subjects and the field independent subjects indicated that a significant difference did exist ($p < .001$).

Group Embedded Figures Test Results

The Group Embedded Figures Test was used to determine the learning styles of Hmong subjects. Results of the GEFT indicated a mean score of 9.667 with a standard deviation of 4.53 for the Hmong subjects as compared to a mean score of 12.0 with a standard deviation of 4.1 for the GEFT norm group.

A two-tailed t-test for independent means performed on the GEFT mean scores of the Hmong subject group and norm group indicated a t-value of 3.1804. A t-value of plus or minus 2.704 was necessary for statistical significance at the .01 level, and plus or minus 3.291 at the .001 level. Therefore, the result of this study in which t = 3.1804 is significant when p <.01 (Table 4.1).

Table 4.1
Results of t-test on GEFT Scores of Hmong Subjects Compared to Norm Group

	N	Mean	S.D.	t-Value	D.F.
Hmong	42	9.667	4.53	3.1804	195
Norm	155	12.000	4.10		

S.D. = Standard Deviation D.F. = Degrees of Freedom

Median score was 9.0. The most frequently attained score was 6. Scores showed a range of 15, from 2 to 17 (maximum possible score = 18). Of the 42 subjects, 28 subjects, or two-thirds of the group, were classified as field dependent with scores of from 2 to 12; 14 subjects, or one-third of the group, were classified as field independent with scores of from 13 to 17. Of the 42 subjects, 23 had scores which fell in the first quartile of the norm group, 5 had scores in the second quartile, 9 had scores in the third quartile, and 5 had scores in the fourth quartile (Table 4.2). It should be noted that the norm group consisted of male students (n=155) from an Eastern liberal arts college in 1971. This may not be an appropriate norm group for a cross-cultural study.

A two-tailed t-test for independent means performed on the means of the field dependent group and the field independent group indicated a significant difference ($p < .001$) (Table 4.3). A t-value of plus or minus 3.551 was necessary for statistical significance at the .001 level. A t-value of -9.90 was achieved, indicating significance at an even more certain level than the .001 level.

Table 4.2
Learning Style Factor of FD/FI in Hmong Subjects as Indicated by Group Embedded Figures Test

Subject	GEFT Score	Norm Q	L.S.
1	2	1	FD
2	3	1	FD
3	3	1	FD
4	4	1	FD
5	4	1	FD
6	4	1	FD
7	4	1	FD
8	5	1	FD
9	5	1	FD
10	6	1	FD
11	6	1	FD
12	6	1	FD
13	6	1	FD
14	6	1	FD
15	6	1	FD
16	7	1	FD
17	7	1	FD
18	7	1	FD
19	8	1	FD
20	8	1	FD
21	8	1	FD
22	9	1	FD
23	9	1	FD
24	10	2	FD
25	11	2	FD
26	12	2	FD
27	12	2	FD
28	12	2	FD
29	13	3	FI
30	13	3	FI
31	14	3	FI
32	14	3	FI
33	14	3	FI
34	14	3	FI
35	15	3	FI
36	15	3	FI
37	15	3	FI
38	16	4	FI
39	16	4	FI
40	17	4	FI
41	17	4	FI
42	17	4	FI

Norm Q = Norm Quartile L.S. = Learning Style

Table 4.3
Results of t-test on GEFT Mean Scores for FD and FI Hmong Subject Groups

	N	Mean	S.D.	t Value	D.F.
Field Dependent	28	7.000	2.841	-9.90	40
Field Independent	14	15.000	1.41		

S.D. = Standard Deviation D.F. = Degrees of Freedom

Individual Interview Results

During interviews subjects identified the following problem solving strategies as means by which they attempted to complete the items on the Group Embedded Figures Test:

Global Strategies

1. Holding an image of the whole simple form in their minds and searching for that image in the complex figure.
2. Naming the simple form with a name that would make it easier to remember (e.g. box, school, house, tie, etc).

Analytical Strategies

1. Identifying and searching for a distinctive part of the simple form.

2. Matching a specific angle from the simple form with possible locations in the complex figure.
3. Measuring lines by counting boxes or judging measurement with their pencils.
4. Taking note of symmetry and proportion in the simple forms and searching for possible locations in the complex figure in which they could be duplicated.
5. Noting a familiar shape (e.g. right triangle, square, etc.) in a portion of the simple form and searching first for that shape in the complex figure.
6. Searching for the simple form sequentially in the complex figure (e.g. starting in the center, at the corner, on the lowest horizontal line, etc.).

Three strategies were mentioned more than the others. During interviews, 29 subjects reported using the global strategy of holding the image of the simple form in mind; 23 subjects reported using the global strategy of naming the simple form. The analytical strategy of searching for a distinctive part was reported as being used by 21 subjects. (Table 4.4)

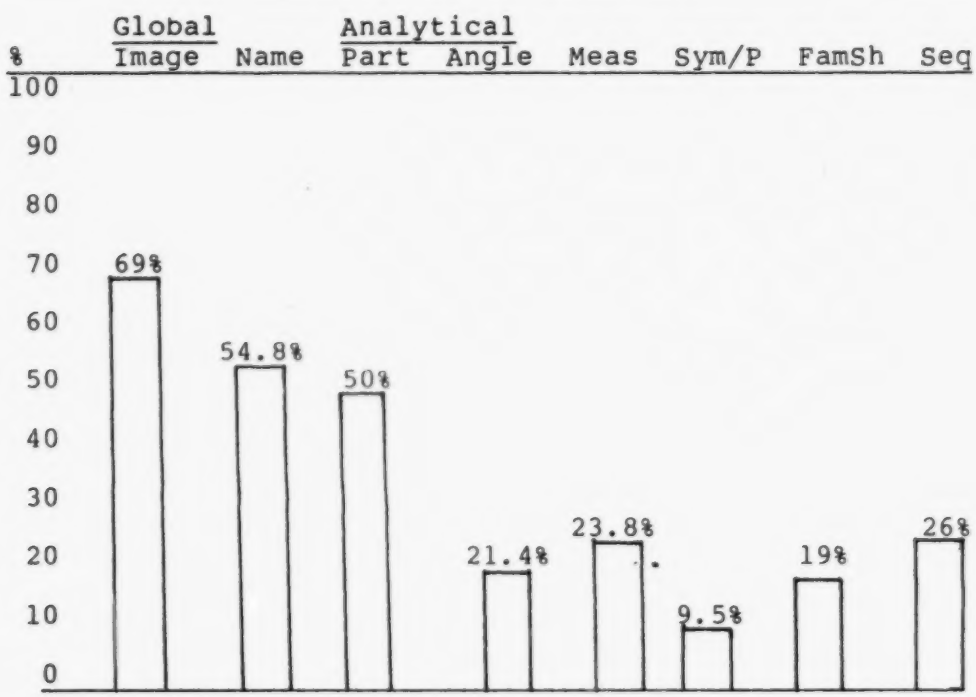
Table 4.4
Problem Solving Strategies Used by Hmong Subjects to Complete Group Embedded Figures Test

Sub	Imag	Name	G St	Part	Ang	Meas	Sym/P	Fam.Sh	Seq	A St	PSS
1	X	O	1	O	O	O	O	O	O	0	Gl
2	X	X	2	O	O	O	O	O	O	0	Gl
3	X	X	2	O	O	O	O	O	O	0	Gl
4	X	X	2	O	O	O	O	O	O	0	Gl
5	X	X	2	O	O	O	O	O	O	0	Gl
6	X	X	2	O	O	O	O	O	X	1	Gl
7	X	X	2	O	O	O	O	O	O	0	Gl
8	X	O	1	X	O	O	O	X	O	2	An
9	O	O	0	X	X	O	O	X	O	3	An
10	O	X	1	X	O	X	O	O	O	2	An
11	X	X	2	O	O	O	O	O	O	0	Gl
12	X	O	1	O	O	O	O	O	O	0	Gl
13	X	O	1	O	O	O	O	O	O	0	Gl
14	X	X	2	O	O	O	O	O	O	0	Gl
15	X	X	2	O	O	O	O	O	O	0	Gl
16	X	X	2	O	O	O	O	O	O	0	Gl
17	X	O	1	X	O	O	O	O	X	2	An
18	X	X	2	O	O	O	O	O	O	0	Gl
19	X	X	2	X	O	O	O	O	O	1	Gl
20	X	O	1	O	O	O	O	O	O	0	Gl
21	X	X	2	O	O	O	O	O	O	0	Gl
22	X	X	2	O	O	O	O	O	O	0	Gl
23	X	X	2	O	O	O	O	O	X	1	Gl
24	X	O	1	O	O	O	O	O	O	0	Gl
25	X	O	1	X	O	O	O	O	O	1	Gl
26	O	X	1	X	O	O	X	O	O	2	An
27	X	O	1	X	X	X	O	O	X	4	An
28	X	X	2	X	X	O	O	O	X	3	An
29	O	O	0	X	X	O	O	O	O	2	An
30	O	O	0	X	X	O	O	X	O	3	An
31	O	O	0	X	X	X	X	X	O	5	An
32	X	X	2	X	O	O	O	O	X	2	An
33	X	O	1	X	O	O	O	O	O	1	An
34	X	X	2	X	O	X	O	O	X	3	An
35	O	O	0	X	O	X	O	O	O	2	An
36	O	X	1	X	O	X	X	O	O	3	An
37	O	X	1	O	X	X	O	X	O	3	An
38	O	O	0	O	X	X	X	X	X	5	An
39	X	O	1	X	O	O	O	O	X	2	An
40	O	O	0	X	O	O	O	X	X	3	An
41	O	O	0	X	X	O	O	X	O	3	An
42	O	X	1	X	O	X	O	O	X	3	An
T	29	23		21	9	10	4	8	11		

X = Strategy used O = Strategy not used T = Total

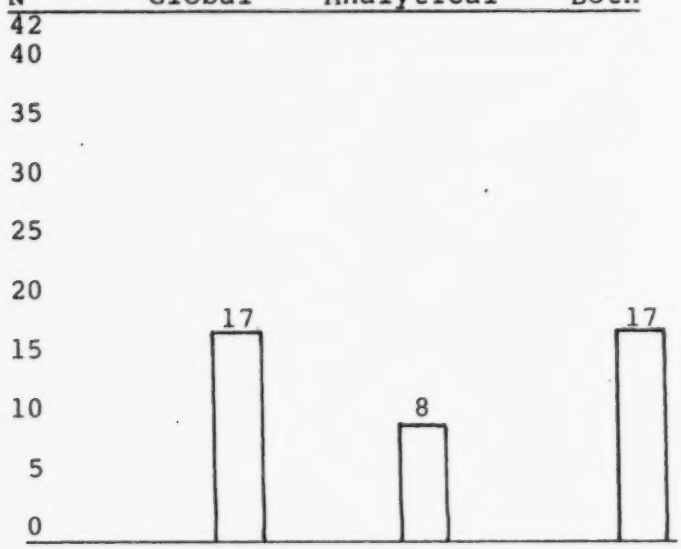
The two global problem solving strategies, imaging the whole simple form and naming the simple form, were reported by the highest percentages of subjects. Half of the subjects (21) used the analytical strategy of searching for a distinctive part of the simple form. The least commonly mentioned strategy was using symmetry and proportion (Graph 4.1).

Graph 4.1
Percentage of Hmong Students Using Specific Global and Analytical Problem Solving Strategies



Of the 42 subjects, 17 reported using global strategies exclusively, 8 reported using analytical strategies exclusively, and 17 reported using both global and analytical strategies (Table 4.4, Graph 4.2).

Graph 4.2
Hmong Students Using Global, Analytical, and a Combination of Both Global and Analytical Problem Solving Strategies



Subjects were classified as global strategy users if they used more global strategies than analytical, and as analytical strategy users if they used more analytical strategies than global. Of the 42 subjects, 21 were classified global, and 21 were classified

analytical (Table 4.4). (Three subjects, those numbered 25, 32 and 33, used an equal number of global and analytical strategies. These subjects were reinterviewed and the strategies they reported weighted, depending on what percentage of items they used a particular strategy, to determine if their overall strategy was global or analytical. Subjects 32 and 33 were then classified analytical and subject 25 global.)

Relationship of FD/FI to Problem Solving Strategies

Of the 28 subjects identified as field dependent on the basis of GEFT scores, interview results identified 21 of those subjects as global problem solving strategy users and 7 as analytical problem solving strategy users. As might be expected, the three subjects who received scores of 12 on the GEFT were identified by interviews as analytical problem solving strategy users. More suprisingly, however, the other four field dependent analytical subjects received scores of 5, 6, or 7. Of the 14 field independent subjects, interview results identified all 14 as analytical problem solving strategy users and none as global problem solving strategy users (Table 4.5).

Table 4.5
FD/FI and Problem Solving Strategies of Hmong Subjects

Subject	GEFT	L.S.	G Str	A Str	Pr.Sol.Strategy
1	2	FD	1	0	Global
2	3	FD	2	0	Global
3	3	FD	2	0	Global
4	4	FD	2	0	Global
5	4	FD	2	0	Global
6	4	FD	2	1	Global
7	4	FD	2	0	Global
8	5	FD	1	2	Analytical
9	5	FD	0	3	Analytical
10	6	FD	1	2	Analytical
11	6	FD	2	0	Global
12	6	FD	1	0	Global
13	6	FD	1	0	Global
14	6	FD	2	0	Global
15	6	FD	2	0	Global
16	7	FD	2	0	Global
17	7	FD	1	2	Analytical
18	7	FD	2	0	Global
19	8	FD	2	1	Global
20	8	FD	1	0	Global
21	8	FD	2	0	Global
22	9	FD	2	0	Global
23	9	FD	2	1	Global
24	10	FD	1	0	Global
25	11	FD	1	1	Global
26	12	FD	1	2	Analytical
27	12	FD	1	4	Analytical
28	12	FD	2	3	Analytical
29	13	FI	0	2	Analytical
30	13	FI	0	3	Analytical
31	14	FI	0	5	Analytical
32	14	FI	2	2	Analytical
33	14	FI	1	1	Analytical
34	14	FI	2	3	Analytical
35	15	FI	0	2	Analytical
36	15	FI	1	3	Analytical
37	15	FI	1	3	Analytical
38	16	FI	0	5	Analytical
39	16	FI	1	2	Analytical
40	17	FI	0	3	Analytical
41	17	FI	0	3	Analytical
42	17	FI	1	3	Analytical

G Str = Global Strategies
A Str = Analytical Strategies

Further clarification of the relationship between the Group Embedded Figures Test and the problem solving strategies identified in individual interviews is shown in the statistical data analysis using the chi square test. A chi square value equal to or greater than 10.827 was necessary for statistical significance at the .001 level. The analysis for this study indicated a chi square value of 18.10714 and therefore a significant relationship between FD/FI and global and analytical problem solving strategies ($p < .001$) (Table 4.6).

Table 4.6
Results of Chi Square Analysis of GEFT FD/FI Learning Styles and Problem Solving Strategies of Hmong Subjects

		Problem Solving Strategy Type		
		Global	Analytical	Row Total
GEFT Learning Style	FD	n = 21	n = 7	28 66.7%
	FI	n = 0	n = 14	14 33.3%
Column Total		21 50.0%	21 50.0%	42 100%

Chi Square	Degrees of Freedom	Significance
18.10714	1	0.0000

Discussion

The research hypothesis that Hmong male students 17 years and older who are attending or planning to attend a post secondary educational institution tend to be primarily field dependent rather than field independent was supported.

Analysis of the Group Embedded Figures Test scores indicated that the mean score of Hmong students was significantly different from the mean score of the norm group. Results of the GEFT in this study agreed with the findings of Hvitveldt (1982) in a study of Hmong adult students in which the Hmong were found to be field dependent. Learning behavior of the Hmong as described in studies by Alter (1982) and Lert (1979) reflects a field dependent orientation; these descriptions agree with the findings of this study regarding the GEFT and field dependence/field independence in the Hmong. Results of this portion of the study would seem to indicate that Hmong students would tend to use global problem solving strategies since field dependent individuals tend to perceive the field as a unified whole and not as a collection of discrete parts.

The research hypothesis that the learning style factor of field dependence/field independence was related to the global and analytical problem solving strategies of Hmong male students 17 years and older who are attending or planning to attend post secondary educational institutions was also supported. Analysis of the relationship between GEFT scores and problem solving strategies of the subjects did indicate a significant positive relationship. This researcher could not discover any other studies in the literature which examined specific problem solving strategies of Hmong students or similar groups and which could be compared to this study.

In addition, a significant difference was found between the field dependent group of this study and the field independent group, indicating two relatively homogeneous groups.

Summary

Findings of this study on the learning style factor of field dependence/independence and the problem solving strategies of Hmong students led to rejection of both null hypotheses. Analysis of data indicated that 66.7% of the subjects tested field dependent on the GEFT and 33.3% of the subjects tested field

independent. Individual interviews indicated that 50% of the subjects primarily used global problem solving strategies and 50% primarily used analytical problem solving strategies. The relationship between field dependent and field independent learning styles and global and analytical problem solving strategies was found to be statistically significant at the .001 level.

Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

This research examined the learning style factor of field dependence/independence and the problem solving strategies of Hmong refugee students who were attending or planning to attend post secondary educational institutions. The Hmong, traditionally subsistence farmers in Laos, were forced to leave their homeland after a generation of war because of harsh postwar reprisals against them. Arriving in the United States, often after years in refugee camps, the Hmong were ill-prepared to enter the urban, technological society into which they were thrust. Until the 1950s the Hmong had been a preliterate society, and most of the Hmong who emigrated to the United States were, in fact, illiterate. Children and adolescents came to their new country from an unsettled childhood spent struggling for survival in wartorn relocation villages, hiding in the jungle, and languishing in refugee camps.

Nevertheless, encouraged by their elders, many Hmong youth are succeeding in U.S. schools in spite of poor educational background, lack of cultural understanding, and limited English skills. Many of

them express the belief that if they are to succeed in the complex technological society in which they find themselves, they will need post-secondary education. A growing number of Hmong are completing high school and have enrolled in vocational technical schools, community colleges, and four-year colleges or universities, intent on social and economic success in the future. In spite of the problems they face, many of these students are characterized by a driving motivation to learn and succeed.

However, support programs designed for other groups of underprepared vocational technical school and college students do not necessarily address the specific needs of Hmong students who add the stress caused by years of war and refugee camps to the frustration of trying to learn in a new language and in a new culture.

One way educators can provide more effective instruction for Hmong students is to design instruction with the students' learning styles in mind. Research has shown that students who have the opportunity to learn through an approach that allows them to use their own learning style strengths will learn more effectively. Research has also shown that individuals

within a cultural group tend to have similar learning styles. Identifying a group's dominant learning style can provide a framework for designing educational programs. However, little is known of the learning styles of Hmong students. It is not clear whether Hmong students possess a wide variety of learning styles or whether they tend to share a common style. It is also not known if the problem solving strategies of Hmong students reflect a global or an analytical basis. Consequently, it is difficult for teachers to effectively adapt instruction to meet the educational needs of Hmong students.

This study sought to discover the learning styles of Hmong students and to find if the problem solving strategies of Hmong students were related to their learning styles. Because it was the learning style factor most studied cross-culturally, the factor of field dependence/independence was examined in this research. Answers to the following questions were sought:

1. To what extent are Hmong students field dependent or field independent in learning style?

2. To what extent are the problem solving strategies of Hmong students global or analytical?
3. Do the problem solving strategies of Hmong students correlate with their learning styles?

Male students (n=42) aged 17 to 36 years old who were attending or planning to attend a post secondary educational institution were the subjects of this study. They attended high schools, vocational technical schools, and colleges and universities in Wisconsin and Minnesota. None of the subjects were born in the United States; all were born in Laos. The average number of years lived in the United States was 5.9 years. All had lived in refugee camps prior to entry into the U.S.; 19 had spent four or more years in a refugee camp. All but four had experienced interrupted schooling.

The Group Embedded Figures Test (GEFT) was used to determine the learning style of the subjects, and individual post-test interviews were used to identify their problem solving strategies. The GEFT was developed by Witkin, Oltman, and Raskin in 1971 as an group administered adaptation of the Embedded Figures Test to provide screening on the field

dependence/independence dimension. The GEFT contains 18 complex figures in each of which are embedded any one of eight simple forms. The subject must correctly trace with a pencil the simple form within the complex figure to complete the item. The test is presented in timed sections with a range of scores from 0 to 18 possible.

The second instrument was a list of researcher-designed open-ended interview questions developed to determine the problem solving strategies of the subjects when faced with a difficult task. Questions attempted to identify how the subjects solved the items on the GEFT.

This study was designed as to determine the relationship between the learning styles and the problem solving strategies of Hmong students. It was hypothesized that Hmong students in the study would be primarily field dependent in learning style and use predominantly global problem solving strategies. It was further hypothesized that a relationship existed between the learning styles and the problem solving strategies of the Hmong students. Both test and interview instruments were used.

Subjects were tested with the GEFT in groups. Immediately following the testing each subject was individually interviewed. During the interview the subject's unscored GEFT booklet was used to provide concrete examples for the researcher and the subject to discuss in regard to problem solving strategies.

Two major results were found. First, the subject group was found to be primarily field dependent with statistical significance at the .01 level. Second, a relationship was found to exist between the learning styles of subjects and their problem solving strategies with a statistical significance at the .001 level. Both research hypotheses were supported by the findings of this study.

Major conclusions are that Hmong students tend to be primarily field dependent in learning style, to use primarily global problem solving strategies, and that their learning styles and problem solving strategies are positively related.

Conclusions

Results of this study support the original hypotheses amd lead to the following conclusions:

1. On the basis of scores for the Group Embedded Figures Test, and a test of statistical

significance performed on those scores, it may be concluded that Hmong students tend to be primarily field dependent in learning style.

2. On the basis of individual interviews and the GEFT scores, it may be concluded that Hmong students tend to use global problem solving strategies.
3. It may also be concluded that a high level of relationship exists between the learning style of Hmong students and the problem solving strategies they choose to use. Those who are field dependent show a strong tendency to choose global problem solving strategies, and those who are field independent show an even stronger tendency to choose analytical problem solving strategies.

Recommendations

This study is one of only a small number that have been conducted on the learning of Hmong students. Although much has been written about the Hmong, little seems to have been done to tune educational practices, especially instructional methods amd types of materials, to the needs of Hmong students. Many of those who teach to Hmong students seem to be impressed

with their students' hard work and desire to succeed and seem to wish to help these students learn more effectively.

Further research to confirm the results of this study could help provide a stronger theoretical basis for the design of instruction for Hmong post secondary students. In addition, a relationship between age or number of years spent in formal schooling and learning style may exist. Further research could investigate the possibility of such a relationship.

Although very few Hmong young women are currently attending post secondary educational institutions, this researcher expects the number to begin to grow in the next five years as more of them finish high school. A study similar to this one, but with female subjects could increase knowledge of the learning styles of Hmong women and girls.

There is a need to develop teaching materials and especially to use teaching techniques that fit the learning styles of Hmong students. Students who are struggling in their learning need every advantage, and certainly the Hmong fall into this category. Reading comprehension materials and higher level vocabulary

materials which are in tune with and take advantage of Hmong learning style strengths are needed.

Most importantly, educators in post secondary settings need to be made aware of ways in which the Hmong can learn best. Lecture, which is one of the most commonly used instructional methods in colleges and universities, may be one of the most difficult for students such as the Hmong to learn from. Working in groups or pairs, synthesizing data, and learning new material in a familiar context all may increase the learning of Hmong students.

Implications

The first implication of this study is that the theory of psychological differentiation is supported by the findings of the study. Certainly, the very high relationship indicated between the learning styles of the subjects and the problem solving strategies they primarily used supports the idea that level of dfferentiation within an individual tends to exist across domains.

A second theoretical implication is that the findings of this study also support other cross-cultural studies in which a relationship was observed between a culture's manner of socialization,

tightness or looseness, and economic system (in particular, agriculturally based systems) and the predominant learning styled of the members of that culture. Descriptions of traditional Hmong culture would have indicated that Hmong would tend to be field dependent. Indeed, this theory appears to be supported by both this study and Hvitveldt's study of Hmong adults (1982).

The researcher cautions against the danger of assuming that because Hmong students appear to be field dependent as a group, that all Hmong students will exhibit field dependent learning styles. This certainly is not the case. The two-tailed t-test for independent means between the GEFT mean of the field dependent group of subjects and the GEFT mean of the field independent group of subjects in this study indicated that two distinct groups were found. Fully one-third of the sample group were found to be field independent, some of these with high scores on the GEFT. Those Hmong students who are field independent should not be expected to behave as the field dependent students would. In fact, informal observation of a continuing nature of a number of subjects of this study in learning situations other than the research

conditions indicate that students identified as field independent by testing do exhibit a number of learning behaviors that are different from those who are identified as field dependent. The true value of the theory of learning style is that it allows for greater understanding of the individual and thus the possibility of greater capability to teach that individual.

Nevertheless, the awareness that as a group the Hmong presently have a tendency toward field dependency is valuable for any teacher who works with Hmong students. With flexibility as the watchword, a teacher may explore new teaching methods and develop new teaching materials that speak to the needs of this growing group in the American post secondary educational scene.

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A.1: Demographic Data Questionnaire

Name_____Birthdate_____

Address_____

Date of leaving Laos_____

Date of arriving in U. S._____

Name of school_____

Why did you choose this school?_____

_____

What is your major?_____

Why did you choose this major?_____

_____

Years of school in Laos (circle grades completed).

1	2	3	4	5	6	7	8	9	10	11	12
Vo-tech	1	2									
College	1	2	3	4							

Years of school in U.S. (circle grades completed).

1	2	3	4	5	6	7	8	9	10	11	12
Vo-tech	1	2	3	4							
College	1	2	3	4							

What subjects do you like most in school?_____

_____

What subjects do you like least in school?_____

_____

What is you current cumulative GPA?_____

A.2: Interview Protocol

1. On a scale of 1 - 5, with 1 = very easy and 5 = very hard, rate the difficulty of the GEFT.

2. Did you feel frustrated while taking the test? If so, what did you do?

3. How did you find the shapes? What did you do to find them? Can you tell me what you were thinking when you looked for this shape (interviewer indicated a specific item that had been completed by the subject)?

4. Did you use the same strategy throughout the whole test? Please explain.

5. When you are faced with something difficult to figure out, how do you usually like to go about figuring it out?